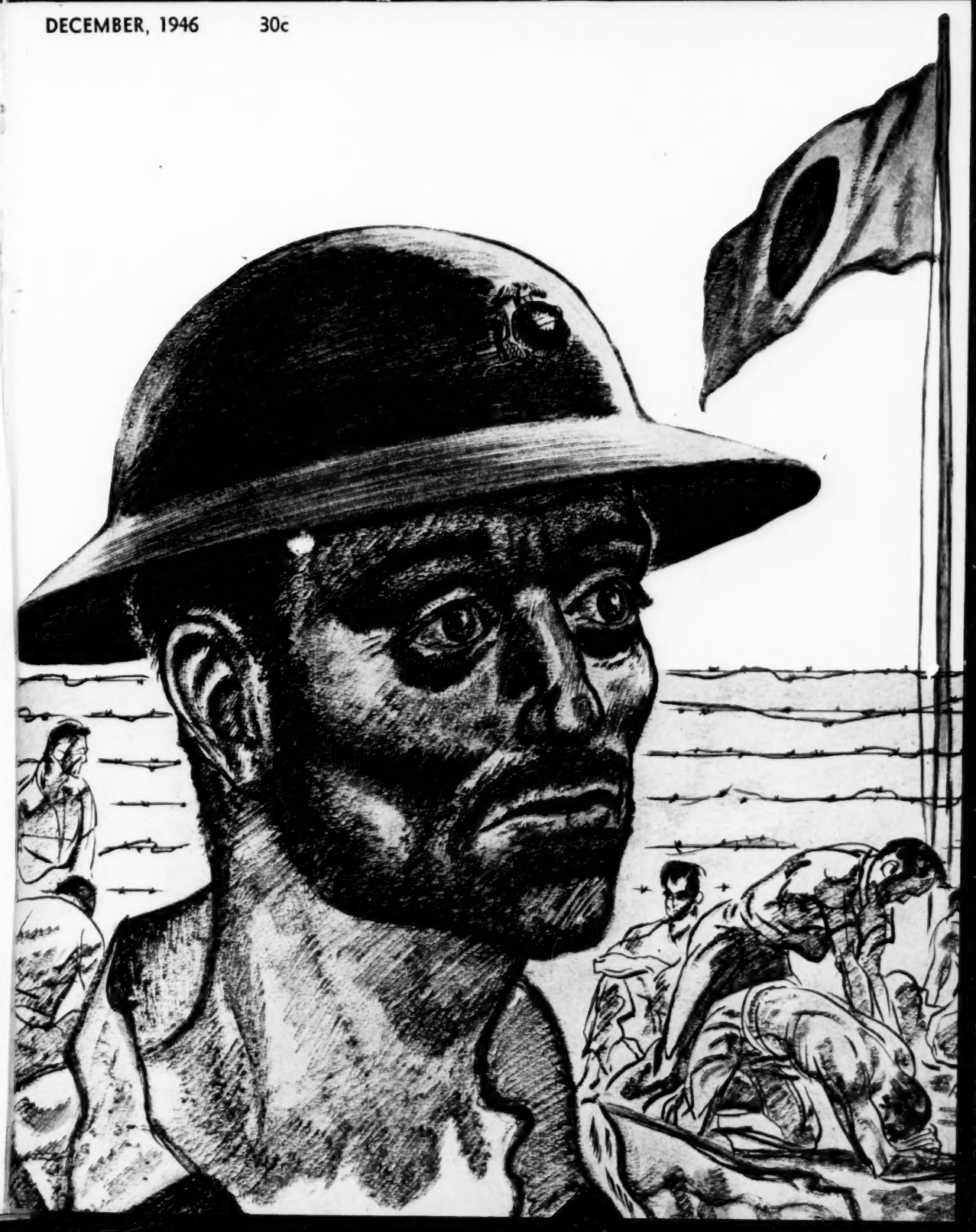
MARINE CORPS Gazette

DECEMBER, 1946 30c



THIS MONTH'S COVER

FAR WORSE THAN ANYTHING THEY SUFFERED on Bataan or Corregidor were the experiences of the 4th Marine Regiment in Japanese prison camps, both in the Philippines and the home islands. Anticipating the climax of Hanson W. Baldwin's *The Fourth Marines at Corregidor*, TSgt John DeGrasse's marine epitomizes the despair of the captured garrison.

THE MARINE CORPS GAZETTE

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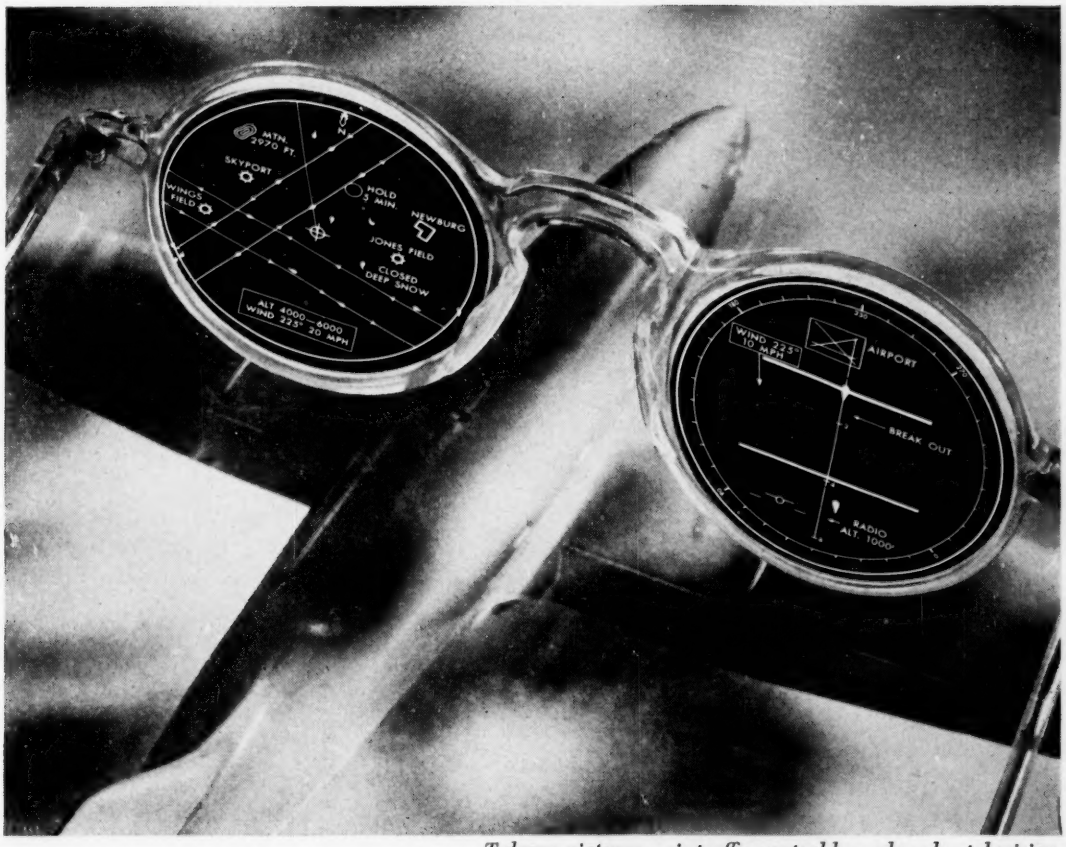

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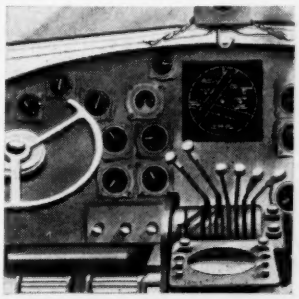

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PASSING IN REVIEW

BOOKS OF INTEREST TO MARINE READERS

Fighting with Fire . . .

INCENDIARY WARFARE—Col J. B. Fisher, Chemical Warfare Service, U. S. Army. 122 pages and index, illustrated. New York: McGraw-Hill Book Company. $3.00.

This book is the first to cover the subject of development and employment of fire as an instrument of war. Quite logically, the author traces the history of incendiary warfare. In so doing he discloses many interesting facts concerning the mysterious "Greek Fire," which for centuries helped shape the destiny of nations bordering the Mediterranean. The discovery of black powder—first used as an incendiary, rather than an explosive—and the early nineteenth century developments of the Congreve rocket, climaxed by the burning of Copenhagen in 1806 by 25,000 incendiary rockets, clearly establish the prominent status of incendiary weapons in the history of war.

Based upon a continuous historical evolution, incendiary warfare, as the book points out, reached its most widespread use and highest efficiency in World War II. The subject of the modern application of incendiary measures is covered in logical sequence with the discussion of explosives and incendiaries, methods of propagating fire, the characteristics of incendiary agents and munitions, tactics of incendiary bombing, wartime defense measures, and methods of preparing against incendiary attack.

While the subject of incendiary warfare is inherently technical, the author has done an admirable job of writing this comprehensive book in a non-technical manner and in a style that is easily readable. The book's value is further enhanced by the fact that it contains much material that previously had been blanketed under secrecy regulations.

As an officer in the Chemical Warfare Service of the Army, Col Fisher was in an advantageous position to write an authoritative book on incendiary warfare. The fire-gutted ruins of German and Japanese cities are indisputable reasons why professional military men should read this book about such a decisive munition of modern war.

JDH

Army Battle Narratives . . .

AMERICAN FORCES IN ACTION SERIES — Historical Division, U. S. War Department. Eight monographs, illustrated, maps.

"In the thick of battle, the soldier is busy doing his job. He has the knowledge and confidence that his job is part of a unified plan to defeat the enemy, but he does not have time to survey a campaign from a fox hole. If he should be wounded and removed behind the lines, he may have even less opportunity to learn what place he and his unit had in the larger fight.

"*American Forces in Action* is a series prepared by the War Department especially for the information of wounded men. It will show these soldiers, who have served their country so well, the part they and their comrades played in achievements which do honor to the record of the United States Army".

This is Gen Marshall's preface to the *American Forces in Action* series. Paraphrasing the thought slightly it might be said that we marines were so busy doing our own job that some of us lost sight of the accomplishments of our sister services. These monographs, eight of which have been published to date, are excellent, well-illustrated battle narratives based on the best military records available. Six more pamphlets are scheduled for release before spring, at which time the final histories will begin appearing.

Present titles which are available from the Government Printing Office are:

To Bizerte with the II Corps—the North African campaign—$.45.

Papuan Campaign—the Buna-Sanananda operation—$.50.

Salerno — American operations from the beaches to the Volturno—$.55.

Volturno—from the Volturno to the Winter line—$.35.

The Winter Line—Gen Mark Clark's Fifth Army in North Italy—$.25.

Merrill's Marauders—the famous composite unit in North Burma—$.40.

The Admiralties—operations of the 1st Cavalry Division—$.40.

Omaha Beachhead—this account of the Normandy invasion is the best of the series and was reviewed separately in the October GAZETTE—$1.50.

These titles are not available through the GAZETTE Bookshop. EHS

War Neuroses . . .

ALL BUT ME AND THEE—BrigGen Elliot D. Cooke, USA. 215 pages. Washington, D. C.: Infantry Journal Press. $2.75.

All But Me and Thee is the assembly in book form of a series of articles recently published in the INFANTRY JOURNAL and written by an Army brigadier general who was appointed as a member of a special committee to investigate and analyze one of the most perplexing and disturbing medical problems ever to confront the Army—*psychoneurosis.*

In essence the book revolves around the travels, interviews, and findings of the author and his assistant, Col Ralph Bing, in their extensive efforts "to determine just what psychoneurosis was, how it had managed to infiltrate into the Army, and what should be done about it."

To most, the selection of an Army line officer to serve on such a committee would seem a bit out of line since such a study to be complete and of any consequence would require technical knowledge and background. Gen Cooke senses this normal assumption early in his book and sets about to explain his selection along with several outstanding psychiatrists by saying, "It seems we had plenty of Army medics practicing psychiatry, but many of them disagreed among themselves, and usually their reports, both oral and written, were completely over the heads of the average line officer. Therefore, by adding me, a doughboy, to the group of eminent specialists called in to investigate the situation, it was hoped, a rather forlorn hope, perhaps, that I might find out enough to present the subject on what might be called the fox hole level."

Traveling from one hospital to another and

finally overseas to question combat leaders and troops, the pair of investigators unearthed a collection of facts and figures which appear to offer convincing proof to even the most skeptical mind—and there were many during the war among blood and thunder troop leaders—that psychoneurosis was a serious and costly problem. But to those who realized the existence and significance of the problem, this strange malady was one affecting the Army only. Even to this sympathetic group, who undoubtedly earned the undying gratitude of the quibbling psychiatrists, the ultimate effect of neurosis was not clear. They failed to estimate the thousands of dollars that are now being paid out by the Veterans Administration as disability pensions to neurosis victims and the like number of men who now bear permanent mental scars.

The startling revelations of Gen Cooke's research are to be found in such facts and figures as the following: In one hospital where some 3,000 NP (Army designation for psychoneurotics) cases were admitted for observation and treatment only 700 were returned to duty, ten were turned over to the Veterans Administration, five were released to the custody of their parents, and about 200 were transferred to another hospital for specialized treatment. The remaining 2.000 were discharged from the Army because of physical disability. Of this group only 20 per cent had seen overseas duty and less than half of that number had been in combat of any sort. These figures, according to the author, were duplicated in other hospitals visited, all of which developed the inescapable conclusion that out of every 50 cases entering the medical wards with an NP diagnosis only seven were returned to full duty.

Discounting the flippant style employed by Gen Cooke for the sake of readability at the "fox hole" level, the book does provide the reader with a rather down-to-earth approach to the subject of psychoneurosis, its causes, symptoms, treatment, and the Army's constant struggle to combat it.

As the author puts it, "We in the Army have always had psychoneurotics with us, but we didn't know what they were. We tried to practice psychiatry, too, although we didn't call it that, and our methods were somewhat crude, to say the least, and certainly not to be classified as a scientific success. I hope that what I have

written on the subject will not only assist the poor devils so afflicted, but will also help the even more confused guys who have to deal with them."

To any person harboring the slightest suspicion as to his possible classification as a border-line psychoneurotic, he need only to read *All But Me and Thee* to find convincing proof that his chances are one in three of being so classified. OKL

Artist's Sketchbook . . .

PELELIU LANDING—Tom Lea. 34 pages, illustrated. El Paso: Carl Herzog. $2.75.

Several months after the September 1944, landing of the 1st Marine Division at Peleliu, readers of LIFE magazine found their attention gripped by a striking collection of paintings by crack LIFE artist Tom Lea. Printed in full color and portraying with frightful detail the artist's impressions during the initial phases of the Peleliu assault, the stark realism of the paintings brought shocked protests from some quarters which claimed the public should be spared such sights. These paintings are now widely conceded to be among the best of the war.

Peleliu Landing is built around the original rough sketches made at Peleliu, from which Tom Lea later painted his finished work. The terse narrative and pictures that compose this book were put down on D-plus-one, before the artist's hand had steadied from his experiences under fire.

The brief (34 pages) narrative effectively binds the series of excellent black and white sketches into a most vivid account of the first 32 hours of the amphibious assault. As Tom Lea himself says, "this book is not an account of a battle, but is the simple narrative of an experience in battle—personal, confused, benumbed and in its deepest sense lonely." As an artist, Lea is superb; as a narrator, he is effectively terse and dramatically detached, although perhaps somewhat over-personal in his sensitive impressions of combat. *Peleliu Landing*, however, rings true in every sense and catches the atmosphere of battle as too few others books have done.

A large size (8"x10" plus), high quality, limited publication with full-page illustrations, this book represents a concentrated dose of battle at its worst which is well worth owning. DMS

THE MARINE CORPS
THE PROFESSIONAL MAGAZINE
FOR UNITED STATES MARINES

Gazette

DECEMBER 1946

CONTENTS

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This Month and Next

THIS ISSUE MARKS THE END OF ANOTHER VOLUME of the GAZETTE, which has been published now for 30 years, thus spanning two major wars and a variety of smaller campaigns and expeditions. This issue also is the last to be edited by MAJ OSBORNE K. LEBLANC who is leaving the regular service. Maj LeBlanc intends eventually to have a country weekly in his home town of Abbeville, Louisiana. On the GAZETTE, he is being succeeded temporarily by CAPT EDWIN SIMMONS, at present the managing editor.

The January book will feature several thought-provoking articles including *To War by Air* by LTCOL RATHVON M. TOMPKINS. Col Tompkins outlines the very logical adaptation of a typical Marine division for airborne operations.

Basic Training—What is It? by LTCOL GORDON GAYLE is an analysis in dialogue form of the purposes and scope of a good basic training program which cuts through much of the contradiction and misunderstanding prevalent on the subject.

Jap Cannibalism on Chichi Jima is something of a shocker by King Features correspondent JAMES R. YOUNG who covered the Jap cannibal trials on Guam. Mr Young was a long-time resident in pre-war Japan and authored *Behind the Rising Sun.*

CAPT LEWIS MEYERS, who has a knack for unusual stories, has written *California Beachheads—1847* which tells of the little-known role of the Marines in winning the west.

Automatic Weapons for the Future

By Capt Melvin M. Johnson, Jr.

WHETHER WEAPONS IN THE HANDS OF THE individual are to become obsolete due to atomic fission remains to be seen. Powerfully armed, compact, independent, and highly mobile airborne troops, capable of being moved thousands of miles in a few hours, may prove to be an ultimate and logical answer to any atomic push-button program. Destruction *per se* does not win the battle. In the final analysis it is control of strategic ground.

In one aspect the United States Marine Corps may render a most significant service as a minute-man police force, ready at all times to move in and quell local disturbances and revolutions. This, one of the traditional functions of the "peace-time" Corps, is likely to prove far more important for the country and for world peace than ever before. How easily a seemingly small-time uprising may now mushroom into a world-scale atomic war! An ounce of lead for prevention is worth a pound of uranium for a cure.

Fire Power and Mobility

AUTOMATIC WEAPONS FOR THE FUTURE MUST necessarily combine maximum effective fire power with minimum weight, maximum reliability, and simplicity. Again, in the interests of simplicity there should be the fewest types of weapons, each type having the maximum versatility.

For example, during World War II infantry armament included the automatic pistol, revolver, submachine gun, carbine, automatic carbine, rifle, semiautomatic rifle, automatic rifle, light (air-cooled) machine gun, medium (water-cooled) machine gun, etc. Here are listed ten types, using four types of ammunition. (Caliber .30, caliber .30 carbine, caliber .45, caliber .38 special.)

Analytically four basic types of rifled weapons are required for infantry. These are (1) the revolver or pistol for close-range personal protection, (2) the carbine or folding-stock carbine for special personnel not primarily armed with the rifle or machine gun, (3) the rifle with bayonet, and (4) the machine gun.

In terms of the latest Marine Corps squad suppose you have an M1919A6 light machine gun which weighs no more than the M1918A2 auto-rifle. So you issue the super A6 three per squad. Then suppose you have a new folding-stock carbine with 8-inch or 10-inch barrel and 20-or 30-shot magazine. You issue this to each assistant machine gunner, or three per squad. Then suppose you have a "merger" of the auto-rifle M1918A2 with the semiautomatic rifle M1, resulting in a basic rifle with 20-shot magazine, firing semi-automatic and possibly full automatic, including bayonet and grenade launcher. Six of these rifles are issued to the 12-man squad (not counting squad leader).

In the higher echelons personnel not armed with the carbine carry the pistol or revolver. The platoon or company machine gun is the same basic weapon mounted on a tripod.

On the foregoing basis we have coupled the fire power of the machine gun with the mobility of the auto-rifle. We have coupled the fire power of the auto-rifle with the mobility of the rifle. We have coupled the fire power, penetration, and range of the carbine with the mobility of a belt or shoulder-holstered pistol. We have complicated our squad supply by continuing with two types of ammunition, carbine and rifle. Query whether that factor is so important as to demand a reduction in power of the basic rifle and machine gun cartridge, or a corresponding increase in weight of the carbine in order to effect a "merger" cartridge. I take it not.

Automatic weapons for airborne infantry of the future along the above lines offer a simplification of types which is greatly needed, especially when we contemplate the other classes of armament required by such a super infantry force, including grenade launchers, rocket launchers, mortars, flame throwers, recoilless artillery, and the like.

Evaluation of combat experience indicates that the machine gun will become a squad weapon. Optimum performance calls for a 20-pound, belt-fed, air-cooled LMG with twice the present cyclic rate, readily adaptable for hip or bipod fire

The Machine Gun

THE MACHINE GUN IS PRIMARILY A FLAT-trajectory area-fire weapon. In World War I it was assigned to the regiment and battalion. After World War I it became chiefly a battalion arm. In World War II it became a company weapon, occasionally asigned to the platoon. The Germans put their MG34 and MG42 in the "gruppe," a twelve-man squad, consisting of a seven-man rifle team and five-man LMG team.

The German belt-fed LMG, assigned to each squad, represented the truly basic arm of the Kraut infantry. However, it weighed 26 pounds with bipod. A squad weapon should not weigh above twenty pounds. The BAR M1918 weighed 16 pounds. The BAR M1918 A2 weighs 19.5 pounds (without butt rest). The obvious and oft-prophesied fact that the maximum effective fire-power and versatility of fire should be integrated in the smallest basic unit of infantry need hardly be expounded here again by the writer as of 1946.

The problem of future automatic weapons actually comes right down to pure technical possibilities, command and staff school concepts notwithstanding. The first specific question then relates to the squad machine gun, necessarily a light, belt-fed, air-cooled automatic readily adapted for hip or bipod fire and capable, with frequent and easy barrel change, of substantial sustained fire from a tripod-type mount.

The following conceptions of machine guns must be qualified if mobility is to be given fair consideration:

(1) The future machine gun is not a World War I barrage weapon continuously firing thousands of rounds over hourly periods.

(2) Certain concessions in the tactical application of the machine gun must be recognized if a squad automatic is to be achieved.

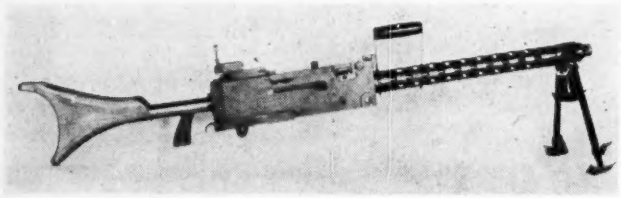
(3) The future machine gun must retain full flexibility as a mobile weapon which can readily be operated by one man, whose assistant is primarily an ammunition carrier and target spotter (using field glasses). Unless, therefore, you personally wish to carry the 40-pound water-cooled M1917A1 plus 45-pound tripod in future airborne operations, relax and forget the Browning M1917A1, M1919A4, M1919A6, or 1914 Hotchkiss. Instead contemplate the future light mortar, rocket launcher, recoilless gun, and flame thrower in combination with the squad machine gun.

The future squad-issued machine gun, three per squad, would be a far cry, therefore, from the earlier heavy machine gun, weighing 90-120 pounds with mount. The future weapon should be lighter than the latest-type German MG42. The barrel should be readily removable. Belts of 50 rounds, joined together by linking belts up to any capacity, would insure flexibility of deliverable fire without reloading. Fifty-round belts could be mounted in dust proof drums attached to the gun, similar to the MG34 for use in the attack.

For nearly ten years there has been a War Department requirement for a 22-pound belt-fed light machine gun. This originally specified tripod-mounting only, but later called for a butt-stock and bipod to be included within the

If Capt Melvin M. Johnson, Jr., USMCR (Inactive) had come on active duty at the war's beginning it is certain that he would be at least two ranks higher now, but it was the Commandant's decision that his work in weapons research and development was more important than his potential value on active duty. Best known as the inventor of the Johnson automatic rifle and Johnson light machine gun, he worked throughout the war for the Army, Navy, and Office of Scientific Research and Development. His books on small arms and automatic weapons are widely accepted as standard texts.

weight limit, the gun to be adapted also for tripod mounting. The air-cooled barrel was to be quickly removable from the front of the gun. The cyclic rate was to be low, about 300-350 R.P.M. In general this gun was required to fire



Browning light machine gun M1919A6

500 rounds in five minutes without keyholing, and to group full-automatic bursts at least 75 per cent as good as the M1917 gun. The barrel could be cooled and gun oiled after each 500 rounds at 100 shots per minute, and the entire gun stripped and cleaned each 2,000 rounds.

For actual service in World War II the Browning M1919A6, weighing 36 pounds, or 14 pounds in excess of the weight limit, came the closest to meeting all the requirements, although a number of guns were tried out. These, as now disclosed in ARMY ORDNANCE,* included the Springfield LMG, Rock Island T13E1, Colt, Sedgely, Auto-Ordnance, Schirgun, T10E1, T10E2, German MG34, Johnson M1941 (magazine-fed), Turner, T23, Johnson M1944 and M1944E1 (magazine fed), German MG42, T24 (modified MG42), and others including a variety of converted or modified BARs and air-cooled Brownings.

The latest light machine guns of Great Britain, France, Russia, Japan, Italy, China, Switzerland, Brazil, and Mexico weigh about 20-25 pounds and all have spring-actuated magazine-type feed. None have belt feed. Germany had two belt-fed guns, MG34 and MG42, each weighing 26 pounds. The U. S. BAR, classed as an auto-rifle or substitute LMG, weighs about 21 pounds with stock rest (magazine-fed). The M1941 Johnson weighed about 14 pounds with bipod, the M1944 models about 15 pounds with monopod. The Johnson guns were magazine-fed, however.

In view of the record it appears that a 20-pound belt-fed light machine gun is decidedly an automatic weapon for the future. Such an arm being so obvious a requirement, some practical consideration of certain mechanical problems is in order.

a. *Stability*—

No 20-pound LMG is likely to possess fully the stability in automatic fire of an M1917 or M1919A4 Browning, tripod-mounted, nor of the M1919A6 bipod-mounted weighing 36 pounds.

b. *Dispersion*—

No relatively lightweight gun can offer as small a cone or pattern in bursts as a heavy gun, mounts being equal, and more especially mounts being in proportion. Compare the M1917A1 tripod versus the M2 tripod, for example. However, the tactical functions of a squad LMG and the old-fashioned heavy machine gun are quite different.

c. *Cyclic rate and automatic functioning*—

No lightweight machine gun, especially of the belt-fed type, can function as reliably at low cyclic rates of fire as a heavier gun, and the addition of a complicated (weight-increasing) cyclic rate reducer does not eliminate this fact. This is an extremely important and significant point by no means fully appreciated.

German light machine gun MG42

Consider the M1917 (or M1919-A4, A6) Browning with its three and one-half pound breechblock (3.4 pounds). To develop an adequate operating momentum this breechblock can travel at a much slower speed than a one-pound breechblock such as the MG42. The breechblock of a 20-pound LMG can hardly weigh very much above 1.5 pounds, and probably one pound is more realistic. Do not forget to allow for the weight of the feeding mechanism within the 20-pound limit.

Consider the cyclic rate problem in another aspect. What is the minimum cyclic rate at which a given gun can successfully operate, fully cleaned and oiled? In general the BAR, minus cyclic rate reducer, can barely function at 450 R.P.M. Some auto-rifles may function at 400 R.P.M. The rate reducer retards the breech-

*March-April, 1946, "Machine Guns" by Maj B. R. Lewis, AUS, pages 242 252.

block at the rearward position, in part depriving the block of the extra speed in a burst otherwise derived from a normal buffer on successive closing strokes. Note, however, that the BAR has a minimum breech opening speed which is equal to a 400-500 rate, and the reducer renders only breech closure less positive. The BAR operates no belt feed mechanism and pulls no belt, however.

The M1919A4, A6, and M1917A1 will generally fail to function at less than 400 R.P.M. An A4 adjusted to function just barely at 400 R.P.M. with AP consistently failed on tracer and M2 ball. AP has a slightly heavier bullet and slightly increased pressure. The M1919A6 offers much more positive and reliable functioning with belt loads when adjusted to fire at 550-600. So also the M1917A1 and M1919A4.

By comparison belt-fed machine guns such as the MG42, having one-pound breechblocks, can not function reliably below 600 R.P.M. A preferable cyclic rate for such guns is at least 800-900 R.P.M. The earlier German MG34 fired at 800-900 R.P.M. and the MG42 fires at 1200-1500 R.P.M. The magazine-fed Jap Type 99 LMG, caliber 7.7 mm, fired normally at 750 R.P.M. The theoretical cyclic rate of the M1 semiautomatic rifle is on the order of 750-800 R.P.M.

Excessive breakage develops at once in the M1919A4 when the cyclic rate is increased to 700-750 R.P.M., and in the M1919A6 at 800-900 R.P.M. The M2 aircraft Browning, having somewhat lighter parts, is especially designed for its rate of 1100-1200 R.P.M. It weighs about 24 pounds. Very radical redesign was required in the new Browning caliber .50 M3 aircraft gun to achieve a rate of 1200 R.P.M. without excess breakage.

Solothurn (German) light machine gun MG34

Thus it may be seen that the total weight of a given machine gun has a definite relationship to the breechblock weight and in turn to the cyclic rate. The heavier guns can function reliably at lower cyclic rates of fire but have a decided limit in their maximum rate. The lighter guns cannot function reliably at the lower rates. In fact they demand a much greater margin for error, that is, for friction due to dirt, dust, rain, etc., because the lighter weight moving parts are much more sensitive to friction.

Another contributing factor in this connection is gun support and total mass. Suppose an M1919A6 at 36 pounds is fired loosely from the hip, versus an MG42 at 26 pounds. The reactions of these guns indicate that the extra mass of ten pounds favors functional reliability. An increased cyclic rate in the lighter gun is essential to insure proper function unless the gun is very well supported, as from a heavy tripod or securely held against the shoulder prone with bipod.

d. *Cyclic rate and ignition; cook-off—*

In another aspect high cyclic rate becomes an important factor in a future feather-light belt-fed air-cooled machine gun. Primarily the Brownings M1917A1, M1919A4, A6, and M2 aircraft are cocked with the bolt closed and a cartridge in the chamber. Moreover, these guns feed their belt on the closing stroke of the breechblock. Accordingly the Brownings take advantage of their buffer to drive the breechblock home on the closing stroke with extra belt-feeding power over and above the driving spring.

These Brownings all stem from the water-cooled model of M1917 in which the barrel chamber is kept relatively cool at all times. The A4 and A6 air-cooled guns have latches permitting the breechblock to be held open as necessary. The chambers of air-cooled barrels can become so overheated in extended firing that a cartridge left in the chamber can cook-off, that is, fire through heat. Moreover, such barrel chamber heat raises powder pressures and aggravates extraction difficulties. The heavy Browning breechblock and T-slot make hot cartridges less of a problem. But consider the future lightweight gun in this connection.

Even the late John Browning cocked his M1918 BAR with the breechblock open. Both German guns, and virtually every magazine-fed foreign LMG (Bren, ZB, Chatellerault, Degtyarov, Nambu, Jap Type 96-99, etc.) cocks with the bolt or breechblock open. When the trigger is

pressed the gun feeds and fires, never leaving a live round in the chamber unless it is a misfire. Two automatics are arranged to fire from a closed bolt on semiautomatic but from an open bolt on full automatic, the Johnson and German FG42. These have hammers or the equivalent. Most of the other LMGs derive their ignition force from the energy of the driving spring or mainspring in breech closure. The Jap Type 96-99 is an excellent example.

The German MG42 not only uses breech closure to develop ignition force but accomplishes half of the belt feeding stroke during a portion of the closure. Some force must be applied to feed the belt in a light machine gun, developed by the gun itself. Accordingly the MG42 with 19-ounce bolt includes an unusually powerful stranded wire mainspring and a most extraordinarily powerful buffer. In the course of firing this buffer adds considerable speed to the breech-bolt in closure, thus assuring positive ignition despite a belt load. Moreover, some added force is needed to push the cartridges forward out of the open-loop metallic belt links. All of which indicates that even in a carefully designed 26-pound LMG cyclic rate reduction through retardation of the bolt at the rear of its stroke would probably tend to imperil not only the reliability of functioning but might also affect ignition. Cyclic rate reduction through slowing up the power stroke is even more serious because of the foregoing.

e. *Tactical aspects of cyclic rate—*

At first glance a high cyclic rate of fire in a light gun with three- to four-pound air-cooled barrel seems rather inconsistent. The high rate tends to aggravate overheating and barrel wear. People with "heavy" trigger fingers can burn up more ammunition, and trigger happy characters might even burn up the gun. Dispersion through lack of control might be excessive.

On the other hand this is a squad LMG. It is with the unit it supports. The gun is not planted 1500-2000 yards away delivering overhead barrages as of 1914-18. Its bursts most closely resemble a pattern of shot from a shot gun. Suppose a burst of ten rounds is required. The object is simply to place ten bullets on an area infested by enemy personnel. There is no magic in extending the time interval for delivery of the burst. Ten bullets hitting the area simultaneously represent the ultimate pattern.

The following table indicates the elapsed time for a ten-shot burst.

Cyclic Rate	How Fired	Number of Shots	Time, Seconds
60	Semiauto	10	10
120	Semiauto	10	5
200	Semiauto	10	3.3
240	Fast semiauto	10	2.5
360	Slow auto	10	1.7
400	Slow auto	10	1.4
480	Slow auto	10	1.25
600	Average auto	10	1.00
800	Fast auto	10	0.77
900	Fast auto	10	0.66
1200	Fast auto	10	0.50
1500	Fast auto	10	0 40

Surely there is no tactical disadvantage in projecting the burst within two-thirds of a second at 800-900 as against one and two-thirds seconds at 360-400. If a rate as low as 300 is required for certain missions, or roughly two seconds per ten-shot burst, then fast semiautomatic fire will deliver the burst in three to five seconds. On at least two occasions one LMG operator has delivered 60 shots per minute continuously for 1500 rounds on semiautomatic. In any light-weight machine gun fast semiautomatic fire offers better control and less dispersion than slow automatic.

Where consecutive bursts are required to cover a given area, time is often a critical factor. Suppose ten bursts of ten shots are needed to cover an area, allowing two seconds average between bursts to re-lay the gun. At roughly 400 R.P.M. we would require 35 seconds. At roughly 850-900 per minute we would do the job in 27 seconds. Where a sudden intense burst of up to 20 or 30 shots is required, the gunner is less exposed to return fire, less likely to be located, and the enemy has less chance to take cover where the burst is quick. Thus, if 30 shots are required in one burst, at 360-400 R.P.M. roughly 4.5 seconds must elapse. At 900 barely two seconds are required.

The proposition that low cyclic rates reduce dispersion is not necessarily so. Much depends upon the design, balance, shape, and handling qualities of the gun. Rates above 1000-1100 are generally too fast for single-shot control with the trigger finger. Nevertheless the MG42 at 1500 can be operated very effectively. Very good results were obtained with a boosted M1919A6 at 900, discounting breakages. Single shots can be "tickled" on full automatic up to 900 R.P.M.

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Fletcher Pratt's

THE Marines IN THE Pacific War

Illustrated by TSgt John DeGrasse

THESE ARRANGEMENTS WERE BARELY COMpleted and Col Edson was just drawing a plan for a reconnaissance in force when at nine on the night of 12 September a green flare exploded over the airfield and almost instantly shells began to crash into the position from the sea. A Jap spotter plane (the marines called him "Louis the Louse") buzzed overhead; a rocket went up from the jungle facing Edson's line, and with yells and a banging of mortars he was attacked. There were so many Japs they seemed to come from all directions at once. They got a lodgement at the center of Edson's line between two of his companies, and they filtered men in who cut all the communications wires, isolated one company at the western end of the ridge, and forced it back. There was hard fighting at close quarters till daybreak; when Edson tried to reestablish his position at daybreak he found the Japs dug in in such strength that no progress could be made against them, so he withdrew the entire position to some knolls near the northern rim of the ridge.

During the day Col Twining of the staff went up to look at the position. The reports from Edson were pretty encouraging, but it was always a good idea to have an eyewitness, especially with Edson, who was inclined to go too far in making light of his own difficulties. The staff man found the ridge held about as weakly as it possibly could be, a front of 1,800 yards in rugged jungle country with only 400 men in line, which meant that there were gaps everywhere, and no wire.

More alarming still was the condition of the Raiders. They had been sent there originally as to a rest area, having carried so much of the heavy fighting earlier. They had just fought desperately all night, with an unsuccessful counterattack during the day, and had undoubtedly given a good account of themselves against numbers obviously superior, but now they gave all the signs of men at the last limit of fatigue, lifting their feet high off the ground when they walked and mumbling their words. The Japs had nowhere withdrawn; it was evident they would attack again that night, the 13th. As soon as Twining could get out of earshot, he grabbed the nearest phone and told the General that the Raiders were done, they could stand no more, must be relieved.

Vandegrift ordered a battalion of the 5th Regiment from across the Lunga, but just as it was making the approach march, down came a savage dive-bomber raid; they had to take cover and could not cross the airfield. It was already falling twilight when they got through, and then too late to relieve the Raiders, so they did the best they could, which was move into a support position. At the front fox holes were dug and fields of fire cleared, not on the usual American system (for which time lacked) but by the Japanese method of opening a narrow tunnel in front of each piece.

As the evening came on all the evidence spoke of a really stout effort for the night. The raid that halted the march of the 5th was only one of four, two of them heavy ones The planes the two carriers had brought saved us; they got into the air raiders 15 miles from the field and made most of them jettison their bombs, shooting down eight machines at a cost of two.

. . . As a matter of fact that battle of the night of the 12th, which had taken so much out of the Raiders, was for Gen Kawaguchi no more than the move to his jump-off positions. There had been rather more casualties than desirable for such a preliminary operation but this might have been expected in crossing the zone where American fire power was dominant. The zone

Part IV: Edson's men repel an attack, the Seabees arrive, the Navy wins a battle

was now crossed; his three battalions were now in a position from which they could drive home the attack at close quarters that night. The General assembled his company commanders and made the assignments. While he was doing it there was a noisy air fight high above the American area and the men could hear the sound of exploding bombs, which cheered them greatly. The time for the main thrust was set very early, at 1830, so that the airfield would be clear of Americans by the time Adm Mikawa's ships arrived at midnight. The battalion of the 124th (Ishitari) which was to take the Tenaru position would attack about that hour and Gen Kawaguchi expected to swing his own three battalions from the airfield against the rear of the same position. His situation as a whole was so favorable that he got off a radio message which led Tokyo (anticipating slightly) to announce that the airfield was Japanese.

VI

UNDER THE JUNGLE COVER DARK COMES EARLY and it could be counted already night when sniper fire on Edson's front began to step up and then on they came, screaming weirdly, shouting "Gas attack!" in English and throwing exploding smoke pots for distraction. The main thrust was straight against the center of the ridge under a strong barrage from mortars and artillery, but there was also a flanking movement through the jungle against the western end of the position (this would seem to have been the Kuma, Ichiki's avengers) with another smoke screen streaming through the trees to lend point to the "Gas attack."

The flank move fell on Co B, forced it back and completely surrounded one platoon, which took fire from three different directions and had to cut its way out. Through the gap thus created, through the interstices of the line Japs infiltrated, cutting communication wires. Col Edson fell back on radio, and matters were not helped by the discovery that the Japs had our frequency. The men were tired out nervously and physically; the whole position began to shake and the lines had become so closely interlocked that it was hard to bring artillery fire down on the enemy. By 2200 there were not over 300 marines holding the position, and Col Edson estimated he was being attacked by two full battalions. (He was wrong, as we know; it was three battalions.) At 2230 came another attack, chiefly at the western end of the ridge under a violent mortar barrage with calcium flares to illuminate our lines and shouting Japs running forward behind the lights. If there could be said to have been a crisis in that long-continued struggle, this was that crisis.

There is a small dominating knoll at the most northerly rim of the ridge. Col Edson pulled his lines back to this knoll, which was held by Co C, refused his right flank to cover against any effort to envelop him and called for artillery interdictional fire on the old positions and all the trails. Maj Kenneth D. Bailey (who got a Medal of Honor for that night's work) strode from place to place through the fire, superintending everything, encouraging everyone. He carried the morale of the whole battalion. Down came the artillery with a crash, battery after battery of pack howitzers and 105s joining, and now it was seen whose men "give cries of pain when wounded" for the whole night was hideous with Japanese screams as the shells poured into them. They had been caught precisely in one of the most accurate barrages of the war. The attacks began to lose force and direction. When Mikawa's ships arrived a little after 2300 and began cruising around the channel, getting off a salvo now and then as they waited for Kawaguchi's flare to signal the fall of the airfield, there was no attack at all going on, the thing had settled down to a fire fight in the dark.

When the battle blazed up again a few minutes later it was to the eastward where Ishitari's battalion launched its attack on the Tenaru line. Unfortunately for that officer he lacked the support of guns; those of the Kumas were either otherwise occupied or had been put out of action in the American counter barrage. Still more unfortunately he had to attack against wire across a grassfield which had been perfectly registered by Marine guns. Those guns could now be spared from Edson's support and they dropped a terrific shoot right into the middle of Ishitari's concentration. The attack stopped; Ishitari assembled his company leaders and made them a speech—this was a difficult operation and all must sacrifice their lives in the service of the Emperor. They attacked again; again that dreadful artillery fire fell on the heads, not an inch could be gained and toward dawn—"Carrying our wounded we regretfully withdrew—the battalion commander, 50 officers, 180 men were killed, more than a hundred men so badly injured they had to be carried on litters." The battalion was in effect *zemetsu*—wiped out.

Meanwhile Col Edson, as he expected, was beginning to get some mortar fire from his left rear. The Japs had infiltrated there and were close to the division command post. But by

0230, though there was a tremendous amount of hardware still flying around, it was clear the position was going to be held. A good deal of the enemy fire was now sniper stuff and they evidently could not work up a concentration in the face of the Marine artillery. They did attempt more attacks to be sure, but each increasingly feebler and rendered still more so by the habit of announcing the move with a red rocket, which instantly brought artillery down on the attackers.

By dawn it was nothing but snipers. American planes from the field began to comb the area and a few patrols began to go out. They did not start soon enough to find the four Japs who popped up almost at the door of Gen Vandegrift's tent, yelled "Banzai," and killing a sergeant with a sword-thrust before they were shot down, but the battle for the ridge, Edson's ridge, was over. It had cost the Raiders and attached Parachutists 143 casualties, 20 per cent of those engaged; but it cost Gen Kawaguchi nearly 2,000 men, and after a jabbering conference with his officers, he decided to withdraw along the jungle trails and the routes of the mountains westward to the region of the Matanikau, where what was left of his force could be supported.

It was a hard, bad march. "I cannot help from crying," wrote one of his officers, "when I see the sight of these men marching without food for four or five days and carrying the wounded through the curving and sloping mountain trails. The wounds couldn't be given adequate medical treatment; there wasn't a one without maggots. Many died."

VII

THE FIGHT AT EDSON'S RIDGE WAS THE KEY action of the campaign but it was surrounded by a series of other events which tended to obscure that main issue. One of them was the attack by Col Oka of the 124th across the Matanikau. This gentleman seems to have been that rarity among Japanese officers, a cowardly braggart. Relations between him and Kawaguchi were bad; he received no support from the brigade artillery, and it is possible that the delay in his own attack was deliberate. At all events, though his was the first of the forces to reach position near Grassy Knoll, it was the last to attack—a sudden rush, made on the afternoon of the 14th after Kawaguchi had already determined on retreat. It was jungle but daylight; the Marine artillery pounded Oka into the ground and by night he was already pulling out. His casualties were few.

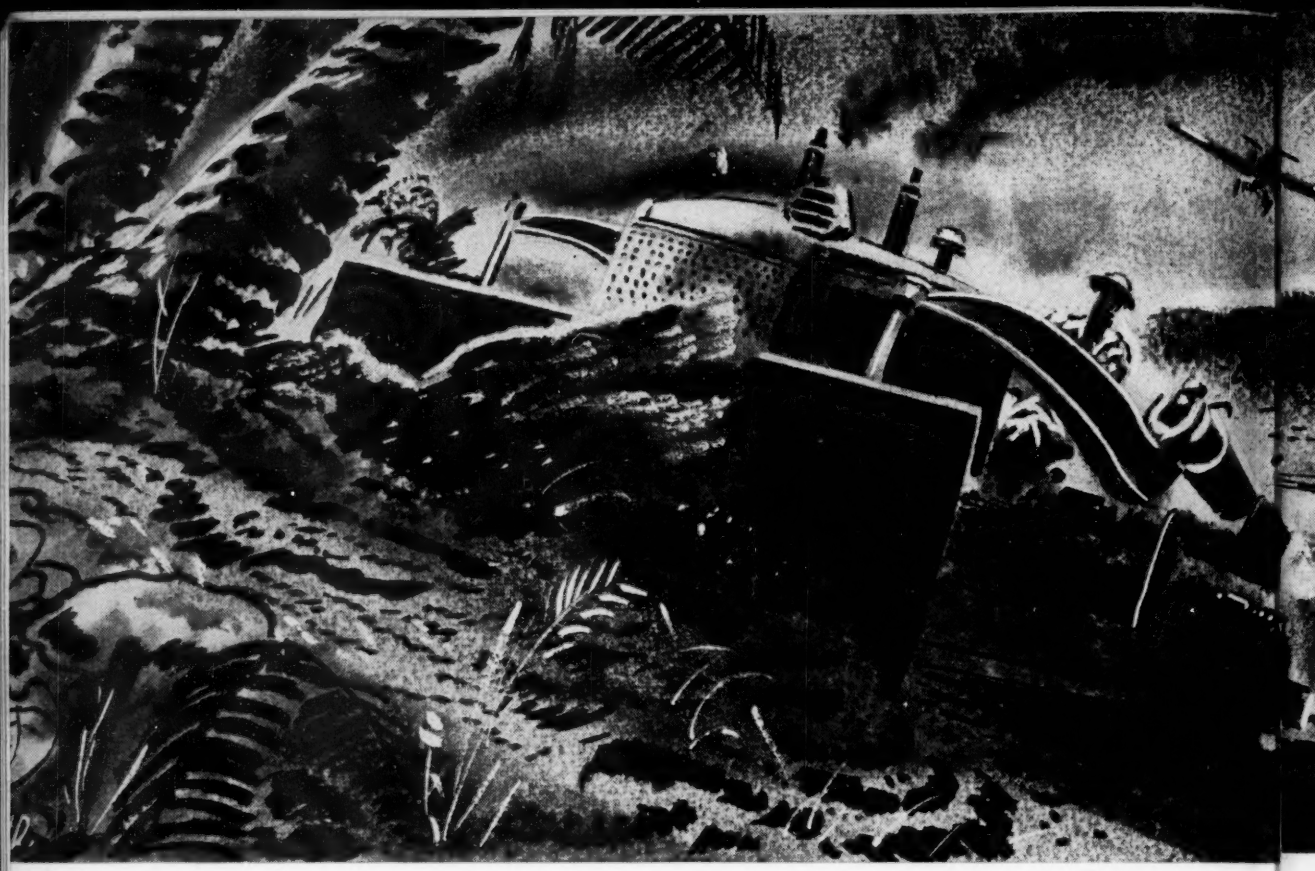
The other events were naval. There had been Jap submarines operating south of Guadal and one of them had slipped a torpedo into *Saratoga's* ribs on 31 August, not sinking the big carrier, but sending her to dock. *Wasp* and *Hornet* had accordingly been ordered to conduct the cover of Turner's transports, bearing the 7th Regiment, from a region east of the Santa Cruz Island screen. They had failed to reach this position because of the need for carrying fighters to Guadal; but turned toward it and were sweeping eastward on the morning of the 15th when a recon report said Jap ships are out of Truk again and bearing down. This seemed more than likely in view of the enemy's operations on the island. *Wasp* and *Hornet* swung northward; and this brought them into the region south and a little east of Guadal.

As it happened this was exactly where the Japs wanted them. To their 7th Submarine Division the 8th had been added, making twelve submarines altogether. These were instructed to change their field of operations from the channel to the waters south of Guadalcanal as it appeared from the Battle of the Eastern Solomons that our carriers would come into this region. The movement from Truk was a feint intended to draw our forces on—a feint which would not have succeeded but for the fact that *Wasp* and *Hornet* had already run far from their intended course on the fighter transportation job.

Carriers and submarines approached each other then; and on the afternoon of the 15th the latter began to fire torpedoes. One of them hit *North Carolina;* she steamed out of the area at 27 knots but still had to go in for repairs. One of them hit the destroyer *O'Brien*; she reached port but after making emergency repairs and putting out to get more permanent ones, she simply dissolved and went down, her structure completely racked. One would have hit *Hornet* but for the amazing presence of mind of a young flier who saw the deadly thing approaching his carrier and dropped a depth charge on it. Three of the torpedoes hit *Wasp*; she burned and sank through a red twilight.

Under that same red twilight, far to the north in Tokyo, a crowd of 30,000 were pouring happily homeward through a litter of torn papers from a patriotic mass meeting at Hinomiya Stadium. They had heard spokesmen of the Imperial Army and Navy announce that Guadalcanal airfield had been captured and "The stranded 10,000 marines, victims of Roosevelt's gesture, have been practically wiped out. Nothing is important but this."

On the last point the spokesmen were correct.



The 6th Seabee Bn, 1100 strong, took over the airfield, proceeded to set it in order . . .

Chapter 5
THE ATTACK OF THE SENDAI: PREPARATION

THE LOSS OF THE WASP HAD THE EFFECT that Turner's big convoy did not reach the island till 18 September, after jigging around for some time along the route while the submarine menace was cleared as well as it could be. The destroyers got two of them (it later appeared; they were not certain at the time) and the rest had to return to Rabaul for fuel and torpedoes, so the convoy went in. On the basis that the essential object of the campaign was Guadalcanal and the troops to hold Guadalcanal, the Jap submarine drive had been a failure, but it is perhaps just as well not to think too hard about that.

At all events there was the new regiment and in the period of relative lull that followed Gen Vandegrift and his staff reexamined the whole theory of the defense, for defense it still must be while Japanese control of the sea was unbroken and their willingness to put in forces unabated. Their movements and consequently their plan had been somewhat limited by the completion of a fighter strip beside the main field and by an increasing flow of planes, which by the end of the month gave our flyers 73 F-4Fs, 37 SBDs, and a dozen TBFs, all organized under BrigGen Roy S. Geiger, "a man who never knew what fear was like" with a heavy jaw, who had been one of the real pioneers of Marine aviation. These planes now began to swarm all over the central Solomons and their operations had quite evidently knocked all idea of using slow regular transports out of the enemy's head. Even the destroyers he did employ for ferrying in troops had to make fast runs so they would not be caught by daylight in the area where our planes were really effective—roughly about Kolombangara.

That meant he must make small scale night landings followed by overland operations; and this in turn meant that the threat of a counterlanding along the Lunga shore was removed as a practical possibility. On the other hand, though there were now enough troops to set up some kind of a defense in depth along the flanks and back slopes where the next attack could be expected, the idea of a defense in depth was becoming dubious. The defense of Edson's Ridge had unavoidably possessed something of this character, and the Japs had infiltrated it so thoroughly in that rough country that the whole business was touch and go. The obvious solution was a really continuous defense line, all round the perimeter with a reserve inside to strike at anything that came through.

Now this is known in military textbooks, as a

they drained the field, laid concrete, built bridges and roads, amazed the marines.

"cordon"; and since Napoleon Bonaparte the generals of every nation have demonstrated how bad a system it is. The defect is that the enemy concentrates all his guns against a spot of the cordon, wipes out the defense there and rushes a big column of attack through to the center with a hurrah. But Japanese artillery practice had been distinctly bad up to this time, and considering the difficulty of moving cannon around in the jungle and the fact that their reconnaissance was poor it did not seem likely that their work with the guns would improve. Moreover Gen Del Valle's Marine artillery had demonstrated at the battle of the ridge that it would have something very serious to say about the jungle trails. Gen Vandegrift boldly threw away the book and established a cordon defense.

In this arrangement the 5th Marines held the sector from the Kukum shore along the ridges to the winding Lunga; the 7th picked up there and carried the line past Edson's ridge to the upper Tenaru where the 1st took over. All the special formations—Pioneers, Engineers, Amphtrac men, Raiders—were concentrated down by the shore around Lunga Point and formed the divisional reserve. The perimeter was wired in (there was wire since the big convoy arrived); foxholes were dug and splinterproof emplacements made for automatic weapons. This was a lot of work but there were now men to do it; the Seabees had arrived, dribbling in a couple of hundred at a time aboard the APDs.

There were 1100 of them, the 6th Seabee Bn, a "cub"* under Comdr Joseph P. Blundon, the first unit of its kind to reach the wars. When they took over, the Marine engineers, who had been thinking pretty well of themselves, were amazed to see how these men beyond military age made the Marston strip fly on the airfield. They turned over all their exiguous construction material to the Seabees and relaxed into straight military engineering, and the Seabees did everything. They drained the field, they built revetments: they put in concrete around the CP and built roads. The old Jap bridge across the Lunga had been in the habit of going out with every rain; the Seabees built a new one, on piles made of coconut trees, with steel girders in it, that would carry a medium tank. They built a bake oven out of an old Jap safe and the Marines had fresh hot bread. They even found a Jap torpedo that had run up on the beach and took it apart. It was our Navy's first acquaintance, except on the receiving end, with that one piece of ordnance in which the enemy far surpassed us, and the big moments of the

*A cub is a unit peculiar to the Seabees. It contains all the units of construction and maintenance men necessary to some particular activity—in this case an airfield. It is composed of "acorns," which are smaller units each skilled and organized to undertake some phase of the activity. The 6th Bn thus contained an acorn of specialists, in road construction and repair, an acorn of drainage men, one of experts in housing construction, plus various others.

American submarine service date from the time when that torpedo went back to the States and our people learned to make them as good. There were also certain researches in the fermentability of various materials (dried jungle rations with sugar and yeast turned out very well), and the manufacture of portable stills—but these were unofficial.

II

THE ARRIVAL OF THE 7TH REGIMENT ALSO made it possible to send out patrols of battalion strength to the west, in which direction considerable numbers of Japs seemed to be drifting through the jungle, probably the wreckage from the recent battle. One of these patrols got into serious trouble.

A battalion of the 7th under LtCol Lewis B. Puller began the movement on 23 September, sliding along the northern face of the ridge Mambula across the Matanikau to investigate the country between it and Kokumbona. There was no effort to make speed—patrols like this occasionally came across Japanese caches of food or ammunition and it was a good idea to search the country for stragglers—so it was evening of 24 September before the northwest flank of Mambula was reached. There were Japs, a lot of them, cooking dinner around fires. Puller had handled his security well, achieved surprise, and in a sharp little action drove the enemy from whatever positions they held. Night prevented him from pushing farther; he had 7 dead and 25 wounded and within his night lines more than this total of Japanese bodies, which gives some idea of the intensity of the fight.

During the night he was reinforced from the 5th Regiment (he had to send some of his men back with the wounded) and next morning he began to move again, reaching the upper Matanikau on the 26th early. He had been supposed to cross this stream but his original instructions also said that he was to return to the perimeter by evening of that date, so he did not cross but continued toward the coast down the east bank of the stream. Near the coastal track his advance parties began to get mortar fire from across the river. It seemed apparent that the force he had defeated the night before and the one now near Matanikau Village were not disorganized remnants of the Kawaguchis, but part of a new landing.

At about the same time he was joined by the Raider Bn, now under LtCol Samuel B. Griffith. (Edson had been moved up to command the 5th Regiment.) Puller and Griffith held a conference. They believed they could stage a repeat on Gen Vandegrift's encirclement of 19 August at Matanikau. Over the wires they succeeded in talking LtCol Twining (now Division G-3) into the idea. Artillery and planes would furnish support next morning for a dawn attack. The Raiders were to move upstream, cross and come down on Matanikau from the rear, a battalion of the 5th to work across the sandbar at the mouth. Col Edson took general command.

Griffith with the Raiders started first as he had farthest to go, but half a mile upstream, still on the east bank, he encountered a force of Japs, apparently the reflux of the groups Puller had hit, coming back in a counter-envelopment. The Raiders deployed but instantly found themselves taking heavy mortar and machine-gun fire from the front and both flanks. In that first blaze Griffith was badly wounded and Maj Bailey, his Medal of Honor exec, was killed. When the company commanders tried to work out flankward they got more fire, were pinned down with the casualties piling up. By now they were not moving an inch but in the confusion, under heavy fire, a request about their position from Edson was answered in a way that gave a clear impression they were over the stream, though they gave no map coordinates because they had no map.

Edson, a driver, energetic and aggressive to the last degree, interpreted the phrase to mean the Raiders were in position for the flank attack on Matanikau. The resistance Griffith's men seemed to be meeting and the heavy fire still coming from across the stream at his own position indicated that more pressure was needed. He asked and got permission to send Puller's battalion of the 7th down the shore by boat to renew the attack from the rear. It happened there was a destroyer (*Ballard*) in the channel that day; her skipper delightedly offered to furnish support fire for the seaborne landing. (Marines know almost by instinct what Army men seldom realize—the power of ship's artillery which makes even a destroyer roughly equivalent to a battalion of medium guns.) The battalion of the 5th was now to cross the sandbar.

It never did. Our guns could not reach the positions that covered the bar and these positions stopped Edson's push. The Raiders still were unable to move. Puller's battalion, under the command of Maj Otho B. Rogers (the Colonel had remained with Edson) got ashore all right, but when they reached a low bare ridge

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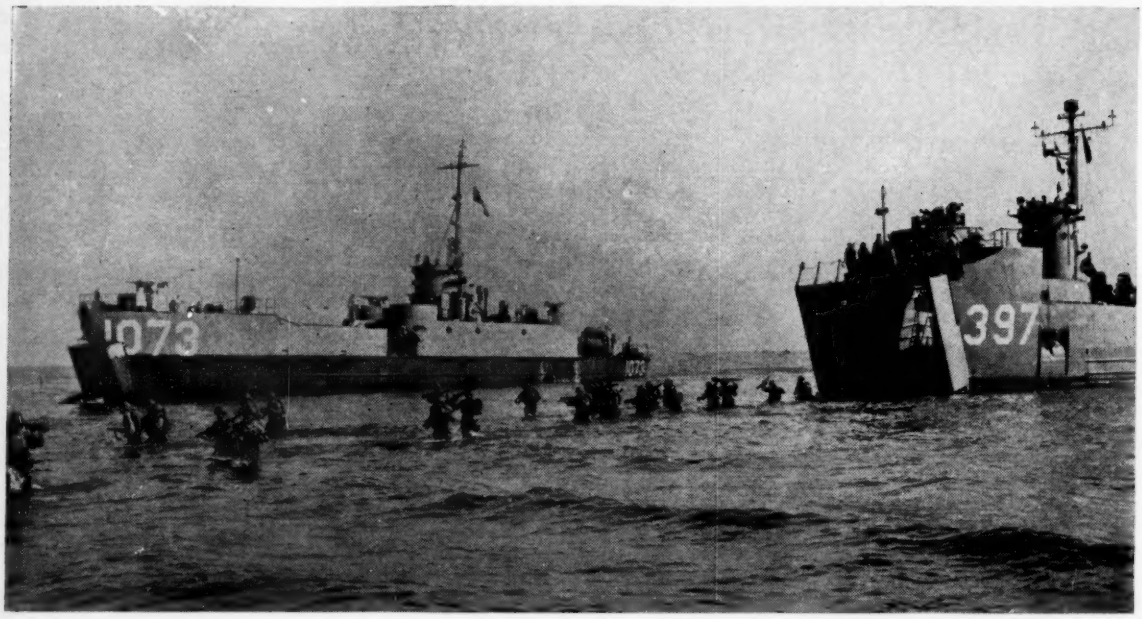
Keeping Up With Amphibious Warfare

By Maj John S. Hudson

THE SECRETARY OF WAR, MR. PATTERSON, WAS recently quoted in the INFANTRY JOURNAL as saying, "Even with the atomic bomb and the great panoply of ingenious weapons we have now or will have, the soldier of the Infantry will still be the backbone of the Army, *the man who takes and holds the ground.*" The amphibious operation has been and will continue to be a special means for getting infantry to the ground they are to take and to enable them to hold it. Whatever expanded cruising dispositions, anchorage areas, and other means of dispersal may be adopted to meet the large effective radius of the atomic bomb, landing assault troops on a properly defended hostile shore requires for success, a great density of effort at the point of contact with the enemy. It follows, then, that the risk of atomic bombing must be accepted and countermeasures must be taken to locate and destroy the atomic bombs at their source, or, failing that, to destroy them in the outer fringes of the combat air patrol.

Be this the "Atomic Age," or be it only the forerunner, amphibious warfare is still a Marine Corps specialty, and until it is proved obsolete, Marine Corps personnel should be thoroughly trained in amphibious warfare. The Marine Corps as an integral part of the naval establishment, is charged with the research and development necessary to continually improve amphibious doctrine, techniques, and equipment. The Navy is responsible for providing the necessary facilities for and conducting all amphibious training of Army units designated for amphibious operations. Logically, therefore, the Troop Training Units, those agencies established for conducting amphibious training, are of a joint-service composition, under the cognizance of the Commanders, Atlantic Fleet and Pacific Fleet respectively.

The TTUs continue their wartime role of training troops in beachhead techniques



Part of a mock landing with midshipmen and cadets, marines of the 1st Marine Brigade, wade waist deep through Chesapeake surf at Little Creek, Virginia.

The Troop Training Unit, Training Command, Amphibious Forces, Pacific Fleet, was instrumental in the training of Marine and Army organizations on the West Coast during World War II. As a result of the centralization of training under the TTU, and the close liaison between TTU and those amphibious commands which were conducting operations in the Pacific, uniform and up-to-date techniques and doctrine were taught all organizations before they were ordered overseas for combat against the Japanese enemy. The excellent training provided was particularly valuable as the tempo of the offensive against the Japanese speeded up. In fact, it was also a contributing factor to that acceleration in that a minimum of additional training was required before a newly-formed or recently-arrived unit could be committed to action. Frequently the actual operation rehearsal was the total additional amphibious training provided an organization prior to its engaging the enemy. The 5th Marine Division, upon completion of training under the supervision of TTU Pacific in the Southern California area, was shipped in echelons to Hawaii in the summer and early autumn of 1944. Actual operation rehearsals in the Hawaiian and Marianas areas constituted the only additional amphibious training afforded that unit prior to the actual assault on the strategically and tactically vital island of Iwo Jima.

Even more impressive is the case of the 4th Marine Division, which assaulted and seized Roi-Namur in the Marshalls after training in Southern California and staging directly from the division base area. In this case the training conducted by TTU actually amounted to an operation rehearsal. A mythical "island," actually part of the Oceanside coastal area, was made a theatre of operations for the training exercises, and a study of the theatre was compiled by the G-2 section. It was not just coincidental that the theatre of operations selected for the exercises was strikingly similar to the actual target area in the Marshalls.

Upon the completion of each operation in the Pacific, reports and recommendations were relayed to the staff of the TTU for consideration, experimentation, and, where appropriate, comment and recommendations. The fact that changes and improvements in doctrine and technique accepted by the Commander, Amphibious Forces, Pacific Fleet, were immediately absorbed in the training program of TTU assured uniformity in the training of units in the Pacific and in the States.

The successful conclusion of the war against the Japanese in August-September 1945, did not relieve the TTU Pacific of a useful and essential mission, but the drain on personnel as a result of demobilization and overseas personnel com-

mitments somewhat hampered the organization for several months. Recently, however, the TTU Pacific was given the mission of training Eighth Army troops in Japan, as well as an Army division on the West Coast. Marine, Army, and Navy instructor personnel were accordingly ordered to the organization, and the training programs are now virtually complete, not only for the training of the troop units, but also for conducting of specialist schools, such as transport quartermaster and amphibious reconnaissance. An abbreviated command and staff course is contemplated for commencement in the near future.

During the war, and under Table of Organization E-265 (Interim), the TTU Pacific was divided into an administrative section and various special instructional sections, such as transport quartermaster, landing craft, waterproofing, communications, and the like. Under the proposed table of organization there is a headquarters section, two mobile division training teams, and a schools team for conducting specialist courses of instruction at the San Diego Base. The headquarters section is organized on the general staff section principle, as are the two mobile division training teams. Since the schools team is to be based at San Diego, that organization can be served by the staff of the headquarters section. Although the proposed table of organization has not yet been formally approved, the actual reorganization along the lines provided by the table has been accomplished in most respects.

When TTU Atlantic was activated on 1 April 1946, there was no table of organization in existence which was entirely satisfactory. It was not feasible to duplicate the organization of TTU Pacific since the existing table for that unit had been formulated for wartime requirements. Accordingly, a completely new table of organization was proposed for consideration by Headquarters Marine Corps, and, after slight modifications, was subsequently approved. This table is based strictly on the general staff section plan, with the exception that an administrative section is provided for in order that all local administrative matters, including personnel, quartermaster, and motor transport, may be grouped under one head, the G-1. In this manner, the instructional sections, G-2, G-3, and G-4, are free to devote their full attention to the training program. Essentially the proposed table of organization of TTU Pacific departs from the general plan of TTU Atlantic only in that it does not incorporate the separate administrative section. Necessarily not only the headquarters section, but also the two division training teams of TTU Pacific are organized on a general staff section basis, since the latter are designed as mobile organizations capable of operating virtually independently of the headquarters section and at great distances from their base at San Diego. On the other hand, TTU Atlantic does not anticipate its instructional teams operating independently of their headquarters group, and therefore has fitted the instructional teams into the headquarters staff section organization.

Maj John S. Hudson, who is now G-1 for the TTU, Amphibious Training Command, Atlantic Fleet, entered the Marine Corps via Platoon Leaders' Class in the summer of 1939. He was commissioned in the Reserve in May 1941 and became a Regular a year later. During the war he served at various places including Londonderry, Northern Ireland; Iwo Jima with the 5th Marine Division; Okinawa and North China with the 1st Marine Division.

Flexibility of organization is common to TTU Atlantic and TTU Pacific. Although the instructional framework of the former is designed for two RCT training teams, while the latter provides for two division training teams, it can readily be altered to increase or decrease the size or number of teams dependent upon the mission assigned. At such times as no troops are assigned for training the TTU staffs can coordinate their efforts with other agencies in research and development necessary to continually improve amphibious doctrine, techniques, and equipment. However, the primary function is to conduct instruction in amphibious operations for Marine Corps and Army units, which is a never-ending task.

Since the courses of instruction offered by the troop training units are essentially the same, and naturally they must be in order to maintain uniformity, an examination of the training pro-

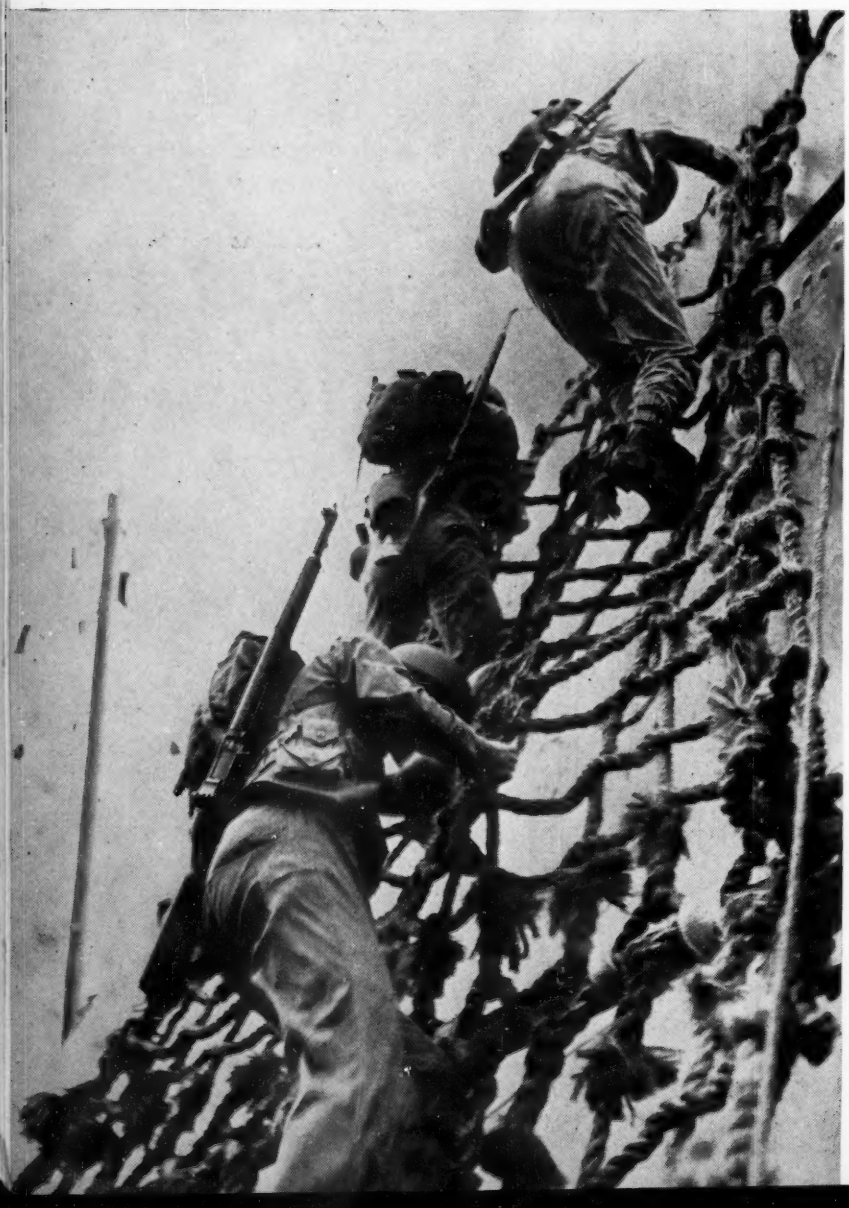
gram of the Troop Training Unit, Amphibious Training Command, U. S. Atlantic Fleet, will suffice to show contents of the courses and methods of instruction.

The training period of TTU Atlantic covers 51 training days, divided into four phases. Phase 1 is the indoctrination phase for officers which consists of six training days, during which the general background of an amphibious operation is drawn by lectures covering such subjects as task organization for amphibious operations, ship-to-shore movement, supporting arms, and logistics. Individual and basic training also commences for both officers and enlisted personnel during Phase 1.

With a working foundation laid during the first phase, Phase 2 begins on the sixth training day. This is the specialist phase, during which officer and enlisted specialists are given training in their respective specialties. In the amphibious staff course, commanding officers, executive officers, operations officers, and selected staff officers will spend training days six through ten in attending classes in the various specialist courses.

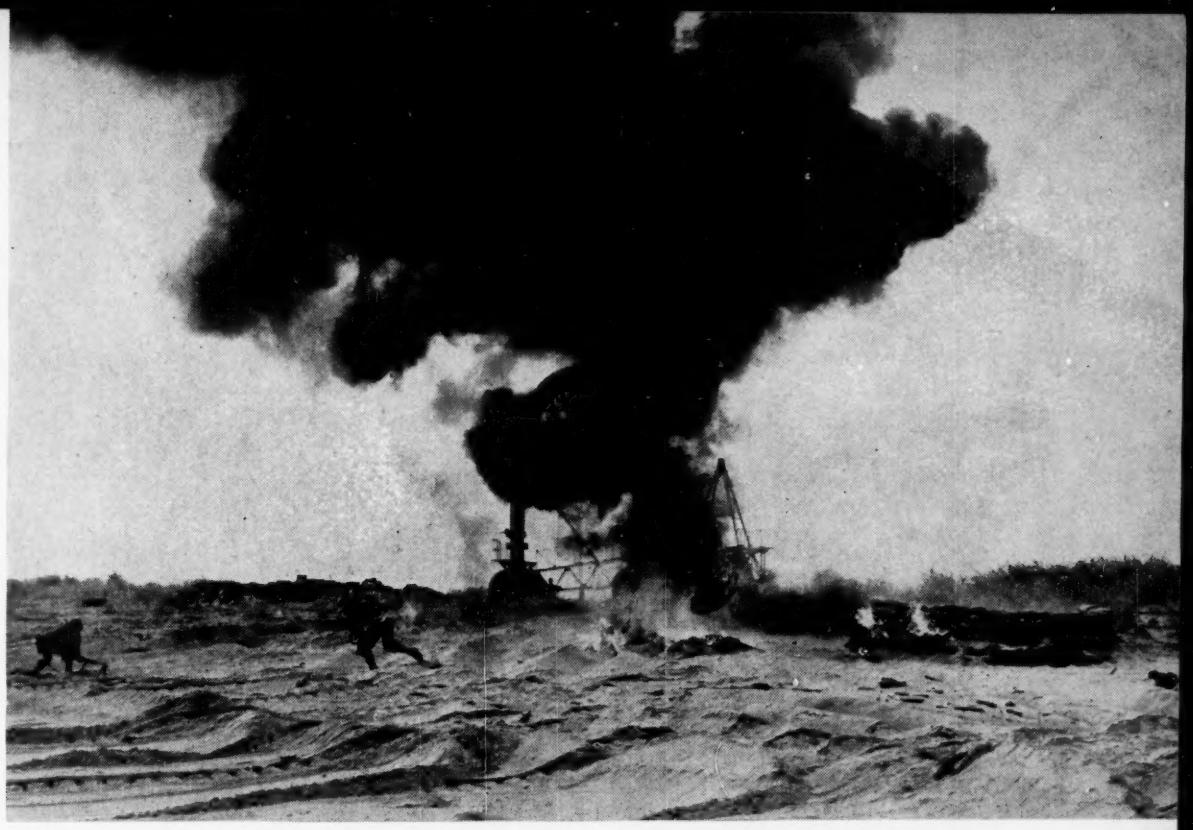
On the eleventh training day the amphibious estimate of the situation and the preparation of the amphibious operation plan (field order) and the annexes will be discussed. Following this, the Corps (Division) operation plan, prepared by TTU, will be presented and the Division Staff will make the estimate of the situation and commence preparation of the complete division operation plan for the advanced landing exercise to be held in Phase 4. The regimental combat team staffs, upon receiving the estimate of the situation and paragraphs two and three of the operation plan, will make their own abbreviated estimates of the situation and complete paragraphs two and three of the regimental combat team operation plan for issue to their battalion landing team commanders. Each battalion landing team commander, in turn, will prepare an abbreviated estimate of the situation and the operation plan for his landing team.

Operating under simulated battle conditions, marines and cadets climb down the nets into a waiting landing craft.



All operations plans complete with annexes must be finished and submitted for final approval by the end of Phase 2 on the 25th training day.

During the planning period instructors of the Troop Training Units will act in a supervisory and advisory capacity only. The mechanics of unit planning and the entire



Operation Camid pioneered series of joint operations for midshipmen and cadets.

preparation of the operation plan will be done by the troop staffs in this phase. Later the operation plan will be executed by the troops in Phase 4 in an assault landing under closely simulated war conditions.

The Amphibious Reconnaissance Course includes thorough instruction in rubber boats, not only for reconnaissance personnel, but also for line troops in the advanced portion of the individual and basic amphibious course.

Amphibious training in air, artillery, and naval gunfire support has been grouped under the single course of Supporting Arms. This is done in order to closely mesh the training of those arms whose employment must be similarly integrated in amphibious combat. Actual firing exercises for students in the Supporting Arms Course will be held on Bloodsworth Island in Chesapeake Bay.

In order to permit the joint training of the several communication teams attached to air liaison parties, artillery forward observers, and naval gunfire parties, the syllabus of the Amphibious Communication Course has been interlocked with that of the Supporting Arms Course.

Training in the Transport Quartermaster Course will center about an assault transport which is to be moored at or near the base. Thus, practical ship loading experience can be gained as well as the classroom subjects ordinarily taught.

In the Waterproofing Course, de-waterproofing as well as waterproofing of vehicles and weapons will be explained, demonstrated, and practiced by the students. Waterproofing of communication equipment will be covered in the amphibious communication course.

The Individual and Basic Course extends through Phases 1 and 2 and embraces 25 training days. During Phase 1, while the indoctrination of officers is taking place, all enlisted men will commence their individual and basic training, The indoctrination lectures for officers are so arranged that these lectures will occupy the mornings only. During the afternoons of Phase 1, officers will train with their troops in the first part of the individual and basic course. The first part of this course includes training in such subjects as organization of boat teams, the lashing and lowering of equipment, and the identification of naval vessels and landing craft. At the conclusion of Phase 1, officers and enlisted specialists are siphoned off into their respective specialist schools. The infantry specialists commence advanced individual basic training which will cover such subjects as rubber boat training and combat swimming.

Phase 3, is a period of five training days dur-

On board the USS *Noble* a TTU instructor demonstrates boat team organization.

ing which troops will embark in small boats at the base and execute battalion landing team exercises on the beaches. This intermediate period is a logical transition from the individual training to the team training and eventual full scale landings. The shores of Chesapeake Bay in the vicinity of Little Creek provide good beaches for elementary landing and training of boat teams particularly in rough weather. South of Virginia Beach are suitable landing areas where more advanced training may be conducted under varying surf conditions.

Phase 4 opens on the 31st training day, when the loading of ships commences. Upon completion of loading, troops embark, and on the 34th training day the Division sails for the Caribbean area. Enroute to the island of Culebra, four days are spent in becoming acquainted with shipboard life, ship drills, manning of debarkation stations, both by day and by night, and the conduct of briefing of officers and enlisted men in preparation for the landing exercise.

Upon arrival off Culebra, which is located southeast of Puerto Rico, two days will be spent in debarkation drills and ship-to-shore practice; one day in executing battalion landing exercises with light equipment only, and without tactical exercise ashore; and, finally, a complete four day division landing exercise will be executed which will require the landing of all troops, equipment and supplies under closely simulated war conditions. A tactical exercise ashore is included as a part of this phase.

Upon the completion of the final exercise, equipment and supplies will be reloaded, troops reembarked, and the ships will sail for the home port. During this return trip, final critiques will be held and all reports will be completed. The last two days of the exercise will be spent in debarking troops and unloading ships, which completes the training period.

This is the picture of amphibious training conducted by the Troop Training Unit of the Atlantic Fleet. In the time allocated, completely finished amphibious units cannot be turned out, but the knowledge, the foundation, and the techniques, together with the experience gained from one full scale landing exercise, will provide the basis for a smoothly geared amphibious striking force. Only combat can provide the necessary actual experience required for a seasoned force.

The United States entered the last war in the enviable position of knowing more about amphibious operations than any other nation in the world. Our dominating position in the field of landing operations did not come about by chance, but was the logical issue of 165 years of specialized study and experience of the Marine Corps and Navy in the complexities of the amphibious subject—in the development of the detailed techniques, doctrines, and equipment which later proved of such value to the armed forces of both our own and allied nations. It is the objective of the Troop Training Units to insure that the armed forces of the United States retain their dominant position in amphibious warfare.

USMC

THE FOURTH MARINES AT CORREGIDOR

SEVERAL INTER-ISLAND STEAMERS FROM CEBU and Panay ran the blockade in February with a little food and supplies, but a submarine took off President Quezon and other top echelon personnel, and the marines were not deceived. The noose was drawing tighter.

Gen Douglas MacArthur with much of his staff left, by the President's orders, for Australia on 11 March. He designated Gen Wainwright, as his successor—but only for the troops on Luzon. MacArthur personally retained command of the over-all Philippine defense from 2,500 miles away in Australia, and he left behind him on Corregidor, a deputy chief of staff to represent MacArthur's headquarters—the top echelon of a pyramided and complicated command—United States Army Forces in the Far East (USAFFE). Three days after MacArthur reached Australia, after a motor torpedo boat and plane hegira, the War Department changed this arrangement by promoting Wainwright to lieutenant general and appointing him to command all United States forces in the Philippines. But MacArthur retained strategic control in Australia and tried, even until the end, to influence tactics.

Hanson W. Baldwin

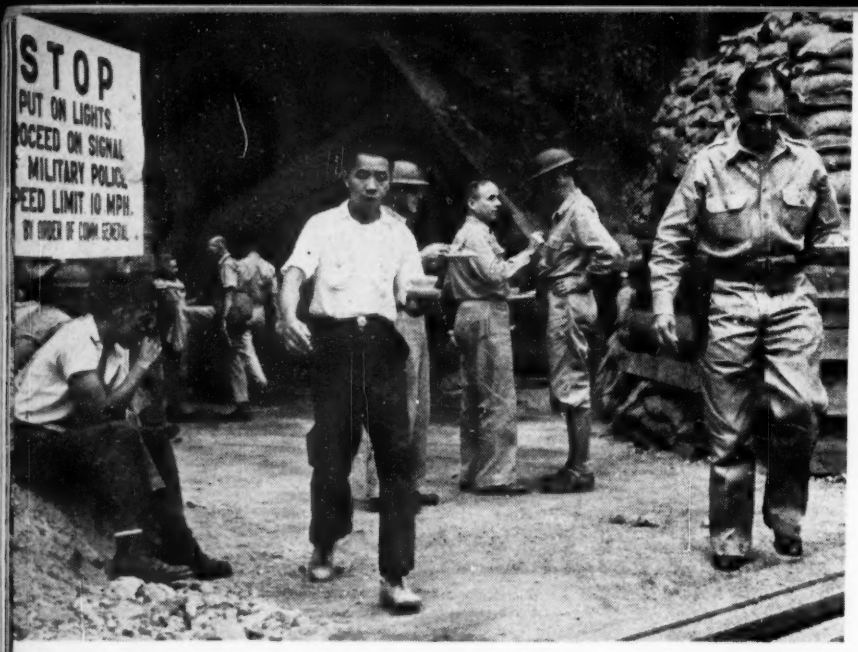
The departure of Gen MacArthur definitely eased some friction on Corregidor. A clash of personalities between Gen MacArthur and Adm Thomas C. Hart, then commander of the Asiatic Fleet, a clash as bitter as it was pronounced, (which pre-dated the war) had marred early Army-Navy cooperation in the Philippines. It had even been reflected in the 4th Regiment by early fears—perhaps entirely unsubstantiated—that the Army wanted to break the Regiment up and use it for training and guard duties. Intelligence cooperation between the Army and Navy had not been good, and the aggressive, egoistic personality of Gen MacArthur's chief of staff, MajGen Richard K. Sutherland, did nothing to pour oil on troubled waters. The situation almost reached the crisis stage about 9 March, two days before MacArthur's departure, when—in a message to the War Department—the general recommended all units on Bataan and Corregidor, with the exception of the Marines and the Navy for unit citations. Indignant Marine and Navy questioners were told by staff officers that this was no oversight. This slur was one of the sources of the bitterness that too often marred Army-Navy relationships in the Pacific later in the war.

But it was an error which was rectified almost immediately after Wainwright took over—and Marines and Navy both got to like this unpretentious commander, who inspected the beach defenses and the front lines frequently and dived for foxholes like the rest of them.

There was little change, as March wore on, and spring approached back home in the States, in the life on Corregidor; the bombs and shells still fell; the work went on; the attrition of time and hunger and disease and bombardment took its slow toll.

Corregidor, like Bataan, was full of Filipinos—many of them non-combatants, the servants of officers, or refugees from Manila. There were probably spies on the Rock; sometimes strange lights flickered at night, and once or twice rockets split the sky seemingly answered by Jap rockets from Cavite. Nor was all the garrison staunch and brave. There were many "tunnel rats"—who despite the heat and dust of Malinta

Part II: A stubborn garrison waits for the food and reinforcements that never came



© LIFE: Melville Jacoby

Malinta Tunnel, as yet undamaged by the Japs, was safest refuge during the air raids and artillery bombardments.

—never left its safety, and who gradually came to assume the pallor and morale of men who dwell forever underground. "Tunnelitis" became an occupational disease.

There was strange inefficiency; not until "the fall of Bataan did the Provost Marshal establish sentries at the various docks . . . and challenge anyone attempting to land on or leave the island." There were shirkers and slackers as there have been in all armies since the beginning of time; there were those—of all services—who cracked under the strain, mentally, and physically; and there were some, like Maj Ridgely, supply officer of the 4th Marines, who "performed unbelievable tasks with ease." But until close to the end some officers of the tunnels used their *lavanderos* and house boys to keep them supplied with freshly washed and pressed uniforms. The marines scrubbed their khaki—when it was scrubbed—in buckets.

IT MUST HAVE BEEN ABOUT THIS TIME, BEFORE the gathering of the last Jap attack against our lines on Bataan, that the men began to hum that lugubrious ditty of Frank Hewlett, the war correspondent. It typified a growing sense of forsaken helplessness, for the Army of Bataan was a gaunt and scarecrow Army—the men, bearded, dirty; the frayed khaki trousers cut off at the knee to make ragged shorts, the Filipinos mostly shoeless—the eyes of all deep, and sunken and hopeless.

"We're the battling bastards of Bataan;
No momma, no poppa, no Uncle Sam,
No aunts, no uncles, no nephews, no nieces,
No rifles, no guns or artillery pieces,
And nobody gives a damn. . . ."

Toward the end of March "all hell broke loose." The bombings and bombardments of the fortified islands were intensified, and on Bataan, the enemy was plainly massing for a big attack, and the weary, desperate defenders had no chance—and knew it. At such a time, MacArthur radioed Wainwright that "you should attack" and "advance rapidly" and drive through to Subic Bay to seize Jap supplies. But these men—who had been moving backward, ever backward, since the war's start—would never attack again; the I and II Corps were skeletons and scarecrows, and some of the men scarcely had strength to hold their rifles.

Many of them knew on Corregidor that the end was near on Bataan, but tails were still over the dashboard, despite the unrelenting, remorseless bombardment, despite a growing hunger. . . . The Fourth were on two meals a day, as they had been since the war's beginning—a couple of slices of bread a meal, the inevitable rice, some dried fruit salvaged from wrecked barges on Corregidor's beaches, occasionally other items—a monotonous and debilitating diet, which neither filled the stomach nor nourished the body. For some few, especially those bivouacked in Government Ravine, this diet was occasionally pieced out by mule meat. The Army's QM mules were picketed near one Marine bivouac, and the Jap shells sometimes provided meat for dinner. But by the end of March the Bataan forces were virtually starving; even on Corregidor, the garrison had lost perhaps 20 pounds a man.

As April opened, the remorseless cacophony of the Jap barrage sounded the knell of hope; the enemy attack was intensified on Bataan, and the II Corps line had buckled. . . . The unequivocal orders of MacArthur left no room for local judgment:

"When the supply situation becomes impossible there must be no thought of surrender. You must attack."

Magnificent phraseology but impossible tactics; Bataan was doomed.

Lt (j.g.) Murray Glusman, a young Navy doc-

tor, who had served with the Army on Bataan, was evacuated by orders to Corregidor in the last hours, and was subsequently attached to the 4th (Reserve) Bn of the 4th Marines. He described Bataan's end, in a report preserved with other records by Comdr Thomas H. Hayes, senior "medico" of the Fourth:

"Four tunnels were blown (near Mariveles, on Bataan's tip)," Glusman said, "by extremely heavy charges of dynamite, destroying the whole mountainside. The air was filled with smoke, dust and flying debris. The din was terrific and terrifying. When (Dr. Glusman) had reached mid-Channel . . . en route to Corregidor, number four tunnel was blown. There was gasoline storage in this tunnel which added to the explosions and intensified the blast which hurled large rocks, boulders and . . . human fragments all over the area and into the sea sinking small boats in the harbor, injuring occupants of small boats. . . . Days later an unidentified human head was found where it had landed in a small boat after having been hurled at an almost unbelievable distance through the air. . . ."

AND SO BATAAN FELL—ON THE NINTH OF April, 1942—smoke and flame its pyre, the green hills convulsed by gigantic explosions[8]. . . .

The terrible aftermath of Bataan — the wrecked, the wounded, the starving—straggled to the Rock for many hours after the surrender. When the day came the marines watched the frantic attempts of fleeing survivors to cross the North Channel in several small launches. Jap artillery ranged on them; the men on the Rock, helpless, saw two boats holed and sunk, and one grounded on Artillery Point. Some of the gaunt survivors swam through the oil-streaked waters to doubtful security; most of them died in the sea.

It was a grim prelude to the last terrible act.

Wainwright felt the inevitable sag in his men's morale and he issued an order—Corregidor could and would be held. And on 12 April, one Flying Fortress—"the first and only outside help we ever saw" bombed Jap-held Nichols Field, and it "cheered our hearts tremendously" Lt Comdr T. C. Parker reported.

The Japanese wasted no time. As the marines stood to their guns, the enemy established forward OPs in the Bataan cliffs and commenced to plaster the Rock with the greatest artillery bombardment the Orient had ever known.

From then on, life on Corregidor was like "living in the center of a bull's eye."

The Fourth expected a quick attempt by the Japs to overrun the Rock; on 9 and 10 April the whole Regiment was alerted, but there was only the increasingly rapid tempo of the enemy's artillery bombardment.

War never goes according to plan, and the Corregidor siege was no exception. It had been hoped that 10,000 or 12,000 men including the 45th Infantry might be evacuated from Bataan to strengthen Corregidor, but the Jap advance had overrun our lines, and the bulk of our troops were cut off. Some 2,000 men, diseased, dirty, defeated, straggled back—some by small boats, some in Navy minesweepers, some swimming—to the Rock, and brought up the strength of the fortified islands to 11,600 men, most of them on Corregidor. But the figures were deceptive; most of these men were non-effectives; many of them "defeated, demoralized, and demilitarized," and hundreds of others were not combatant troops, but ordnance men, medics, and miscellaneous personnel of a great headquarters. There were many headquarters on Corregidor—the remnants of MacArthur's "USAFFE"; Wainwright's "U. S. Forces in the Philippines"; the headquarters of MajGen George F. Moore, commander of the Harbor Defense of Manila and Subic Bay (the fortified islands); the Navy, and many smaller echelons. The American "talent" for over-organization was first manifest on Corregidor[9]. There were too many service and headquarters troops and not enough foot-slogging fighters.

But perhaps it was just as well that the 10,000 to 12,000 men that war plans had called for were not able to get over from Bataan. For food was getting scarce and with the fall of Bataan the water situation on the fortified islands immediately became serious.

Some types of ammunition—despite sporadic replacements by submarines—were low; there were only about 500 rounds of the most useful 670-pound antipersonnel shells for the 12-inch mortars.

There were enough rations; if halved the food might last to July or August.

Two days after Bataan's fall friendly Filipinos from Manila smuggled in at night some 650 dollars worth of quinines and medicines they had collected from the city's drugstores. But it was a drop in the bucket; the hospital laterals

[8]And by titanic forces of Nature. There was an earth quake about midnight of the 8th, which caused the Malinta Tunnel to "weave like a snake."

[9]The same Churchillian paraphrase that later was applied to the Allied Headquarters in North Africa—"Never in the course of human history have so few been commanded by so many"—might have been applied to USAFFE and Corregidor.

were filling up; there were more than 1,000 wounded, and hundreds sick. Fifty per cent of the 1st Bn personnel already had undergone an epidemic of acute gastro-enteritis, and 114 of the cases had been severe. Most of the attached personnel from Bataan had malaria and a good many of the marines, too; there had been a mild outbreak of tonsilitis; all hands had been vaccinated for cholera, and there had been many cases of jaundice.

Communications, never good, were severed time after time and the CPs in Malinta Tunnel were out of touch, hour after hour, with whole sections of the beach defenses. Many of the Navy's minesweepers, local defense craft, and small boats had been sunk; others clustered closely to the Rock, looking vainly for protection from the enemy's murderous fire.

The beach defenses, isolated from the command and from each other, cached water supplies, rations and ammunition.

So, facing the end, Corregidor girded for defeat.

THE BEACH DEFENSES, REORGANIZED AND AUGmented by refugees from Bataan, sailors whose ships had been sunk, airmen, without planes, coast artillerymen, and antiaircraft gunners without guns, were prepared for what many of the marines now knew would be the last chapter.

The 4th Regiment had been plumped out by these ragged accretions to almost 4,000 men[10]. It had absorbed into its ranks—after a fashion—895 officers and men of the Navy; 397 men of the United States Army (including a few from the 31st Infantry which had fought magnificently on Bataan); 929 from the Philippine Army, and 246 artillerymen of the Philippine Scouts. There were even Filipino messboys of the Naval Reserve, ground crews from the Philippine Army Air Force, one officer and 18 men from the Philippine Constabulary, and at least one civilian —who fought stoutly.

These additions were welcome, but they added doubtful strength; the resulting force was heterogeneous in character; none of the navy men and few of the others had had more than cursory training as infantry, and as Col Howard later reported, "with the exception of three Philippine Scouts, all personnel that joined at this time (after the fall of Bataan) had to be re-equipped and at least partially clothed.

"Due to sickness from malaria and dysentery and malnutrition," the report continued, "the physical condition of these officers and men was generally deplorable and they were unfit for combat duty."

Nevertheless the increments were assigned to bring up the strength of the 1st and 3d Bns to about 1,100 men each; the 2d Bn's strength was increased to about 900, and the rest were assigned to the General Reserve, and to creation of a 4th Tactical Bn (sometimes called the "Naval Battalion" because of its preponderance of naval personnel), which had "the highest lettered companies—Q, R, S, and T—we had ever heard of."[11] Maj Francis H. (Joe) Williams of the Marine Corps, whose name shone out in all those final days as a man without fear, was assigned to command of the new battalion which had a strength of about 28 officers and 500 men, and it was placed in Regimental Reserve, along with the Headquarters and Service Co of the 4th Marines (Cos O and P numbering about 13 officers and 300 men, about half of them naval personnel), under Maj Max W. Schaeffer.

The beach defense artillery, under Col Ausmus, was organized as follows:

East Sector—Capt Jules D. Yates, USA, Artillery Officer

1—75 mm gun Malinta Hill (North)
1—75 mm gun Malinta Hill (South)
1—75 mm gun Malinta Hill (West)
3—75 mm guns North Point
2—75 mm guns Hooker Point
1—75 mm gun Monkey Point
1—75 mm gun Tunnel gun

10—75 mm guns

Middle Sector—Capt Smith, CAC, USA, Artillery Officer

2—75 mm guns Breakwater Point
1—75 mm gun Ramsey Ravine
1—75 mm gun Point Conception
1—75 mm gun Spanish Fort
1—75 mm gun C. R. #73
1—75 mm gun Stockade
1—155 mm gun Stockade
1—Navy 3" landing gun—200 yds SW North Dock

1—155; 7—75s; 1—3" Landing Gun

[10]Most of them on Corregidor alone. There were about 100 marines (plus several hundred naval personnel) serving on Caballo and El Fraile islands nearby.

[11]As reported by Lt Charles B. Brooks, USN, a company officer in the Battalion, who lost a leg on Corregidor. Brooks is now a captain.

This photo taken by a Jap reconnaissance plane was widely used as propaganda.

West Sector—LtCol Harry J. Harper, FA, USA
Artillery Officer

1—75 mm gun Wheeler Point
1—3″ Navy landing gun—200 yds W. of Geary Point
1—75 mm gun Craig Hill
1—75 mm gun on beach James Ravine
1—75 mm gun James Ravine

4—75s; 1—3″ Landing Gun

Beach Defense Searchlights

1—36″ Light Hooker Point
1—36″ Light San Jose Point
1—36″ Light Malinta Point
1—18″ Light Cavalry Point
1—18″ Light North Point
1—18″ Light Monkey Point
1—60″ Light Breakwater Point
1—36″ Light Skipper Hill
1—36″ Light Battery Point

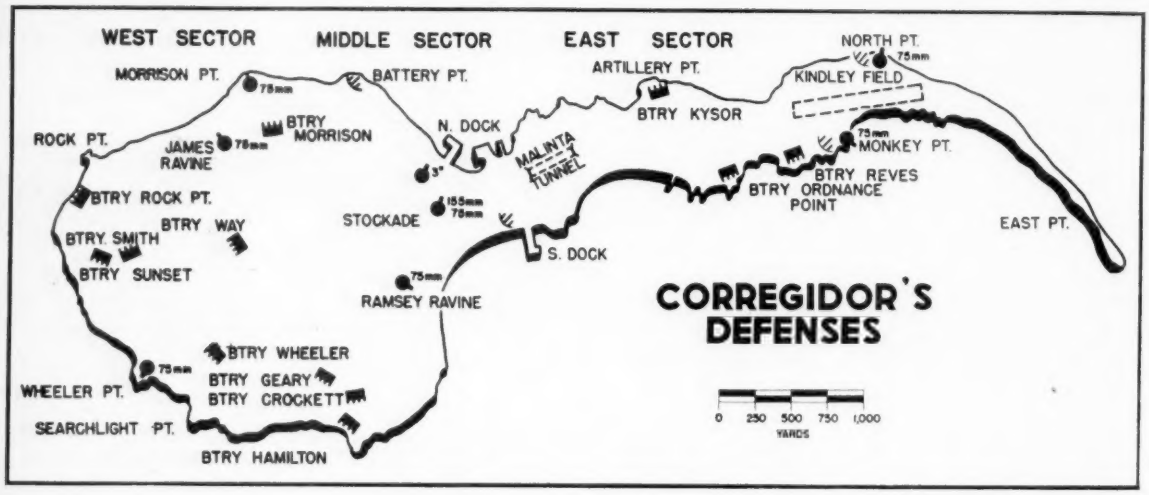
1—60; 5—36s; 3—18s

Some of these guns were old British 75s and even old navy saluting guns adapted to antiboat use, and there were several old 37 mms. There had originally been a total of forty-eight 75s, but some of them were not under beach defense control and others already had been knocked out by Jap shells by the time Bataan fell.

ANOTHER SUBMARINE RAN THE BLOCKADE THE night after Bataan fell, but enemy activity at sea and ashore was so intense that she could not unload all her cargo and she narrowly escaped destruction when she left. The noose was tightening.

Two Jap observation balloons went up over the green-jungled hills of Bataan on the 14th and the Jap batteries commenced ranging methodically on gun emplacements on the Rock. Hidden in deep jungled ravines on Bataan and Cavite, but with air spots and excellent observation from the towering summits of the Bataan hills, the "Japs were looking down our throats during all that last month." Corregidor and its companion islands—but especially Corregidor—were under cross fire from both shores, and the bombing raids and artillery barrages became almost continuous. Within five days after Bataan's surrender all the north shore 155s and 3-inch seacoast guns had been knocked out, and the AAs were taking it.

Jap bombers—in groups of three to nine—



flew over the Rock every couple of hours from 0800 to sunset. At first, they flew at 20,000 feet, but when the AAs opened, Jap OPs spotted their position and enemy guns on Bataan smothered them in gunfire. Gradually the AA fire slackened and fell; soon the enemy planes were swooping leisurely over Corregidor and dive-bombers were hurtling to within a few hundred feet of Malinta's crest. The enemy did not escape unscathed; a few planes were shot down, but much fewer than the number claimed in the communiques.

"Whole areas were blasted out. One day's shelling did more damage than all the bombing put together. James Ravine, which was heavily wooded before the war, looked completely bare after the shelling. . . ."

Btrys Rock Point (two 155s), Sunset (four 155s), James (four 3-inch) and Hamilton (two 155s) were out. Fifteen AA guns were salvaged and moved to new locations. The 155s used for counterbattery work were shifted after each two rounds of fire to new positions. All mobile guns were moved into one-gun defiladed positions.

But these measures merely postponed the inevitable.

The enemy ringed the Rock with from 80 to 150 batteries, up to 240 mm in size and the unending barrage destroyed the defenses faster than they could be rebuilt and gradually chipped away the taut nerves of the defenders.

Gun emplacements were wrecked, landmines exploded, the little vessels of the Navy's inshore patrol sunk one by one, wire destroyed, beach defenses—painfully built up in weeks of toil—razed in one crushing barrage.

CORREGIDOR'S COUNTERBATTERY FIRE WAS brave but intermittent; the Rock's batteries fired "blind" and even in the first half of April the ratio was at least one shell against four.

And ammunition was running low; ordnance technicians working steadily modified the fuzes of armor piercing shells to explode on impact, but their best efforts added only 25 rounds a day to the magazines.

The 4th Marines, crouching, eating, sleeping, waiting in foxholes or in shallow tunnels dug into the sides of the hills, bore with dull stoicism this unending bombardment. Meals now were haphazard; kitchens were hit; cooking had to be done in the dark. Some units were on one meal a day; all had breakfast before dawn, dinner after dark. The menu was monotonous, sufficient to sustain life but not to satisfy.

"For supper," Lt Jenkins reported, "we had a sort of stew, which consisted mainly of rice and a couple of pieces of bread, and maybe a little jam. For breakfast, prepared and issued in the evening, we had a cold bacon sandwich or a tiny can of sausage and coffee." Other units were not so lucky as Jenkins'. Some lived on Army "C" rations; some had little but rice. Some men put pieces of bread in their pockets to gnaw on during the long fast between breakfast and supper.

The 4th Battalion, in reserve, was in a bivouac area "along a winding road around the Btry George observation post.

"Our first job was to dig in and make our

position livable," Capt (then Lt) Brook pointed out. "Here, as on so many other occasions, I marvelled at the wonderful adaptability of the U. S. bluejackets (the 4th had a large number of naval personnel—"we boasted of being the highest paid battalion in the world, as most of the men were petty officers of the upper pay grades") at home anywhere afloat or ashore, always ready to cheerfully undertake anything. Always they were inspired by the wonderful example of Maj Williams, who seemed to be everywhere at once, supervising every job, always thinking of nothing but the welfare of his men. The other marines were also fine examples, and a great help to the naval personnel, who had had so little experience at land warfare. Among other things, the Marine enlisted men kept trucks running to the supply depots, often under fire (during early April; later, trucks and roads were destroyed). It was due to them our food was always brought up on time. . . .

"In the foxholes the men laughed and joked and more and more the talk was about food. In a hole near mine, two men would spend all the time during bombardments giving long descriptions of what they used to eat back on the farm. Usually, during long bombardments, somebody would start to sing, and we would all join in. Shells and bombs were falling in our area . . . and we were having casualties. Once, as shell fragments were flying all around, I heard somebody say, 'there is a piece of my old Ford.' . . .

"Evenings were the best times we had. We would sit along the top of the hill and look out to sea, or look over to Manila, where the lights were on again. The men talked about food, about liquor, about women—about the things that soldiers have always talked about—but never about the hopelessness of our position. Never once did I hear anybody despair. In fact, they were just the opposite, believing every rumor that help was just about to arrive. (But not all of them; many showed even a greater courage; they knew they were doomed but they fought the good fight). Once I was very happy to see a message of greeting from the commander of Malta to the commander of Corregidor, saying that the eyes of the world were upon these two isolated garrisons. Later, I was glad to hear that Malta held out till the end of the war."

On and on, days without end, the bombardment continued — malevolent, implacable, malign. . . .

Malinta rocked and shuddered to the crash of explosion; the reeking tunnels stank of powder fumes and stale sweat; the feverish wounded moaned. One by one, Corregidor's guns and batteries were wrecked; food and ammunition dumps were buried, cliff faces blasted into the sea, the whole topography of the island changed; casualties mounted; the Marines suffered more killed and wounded in April than in the previous four months of war.

. . . ONE NIGHT A GROUP FROM MALINTA CAME to the sandbagged entrance to get a breath of fresh night air. The night was momentarily quiet; a soft breeze from the China Sea cooled the battered island . . . back home in the States, it was spring, and the breeze spoke of home. . . . Without warning a Jap 240 mm landed in the midst of the group. Hours later, after the bloody work with the scalpel and bandages had been done in the hospital laterals, a marine found a young Army nurse, weeping bitterly. . . .

The enemy artillery "methodically smashed every building that was still standing," Lt Jenkins reported. "They hit and exploded a large powder magazine on Cavalry Point. The terrific concussion of the explosion completely stripped the clothing off men in nearby foxholes. Some men were badly burned and others were buried alive. . . .

"While Battery Kaiser, a 155 mm gun battery

Rifles and grenades were no match for long-range artillery and heavy bombers.

on Infantry Point, was being pounded, a shell hit on the very tip of the point, knocking the whole rocky end of it on to the beach below. No traces of the men who had been manning an observation post on the tip of the point were ever found. . . . Three large concrete powder magazines down on Enlisted Men's Beach were hit and completely destroyed when they exploded and burned with terrific force, knocking out a search light and several gun positions. . . . ('After each intense shelling,' LtCmdr (now Capt) Dennys W. Knoll, reported, 'at least three ammunition dumps would continue burning and exploding for a couple of hours. . . .') The side of Malinta Hill facing Bataan was taking a terrific beating," Jenkins noted. "We had two machine gun positions up there. . . . These positions had been hit, burying the guns. We dug them out and got them in working condition again. . . . Men who were lucky enough not to get hit themselves by shell fragments had their rifles hit and damaged. The number of damaged rifles increased with the rapidly increasing intensity of the Jap artillery barrages and it became increasingly difficult to make replacements. . . ."

AFTER SUCH A DAY OF INFERNO, LARGE SECtions of Corregidor would lie shrouded in clouds of smoke and dense dust—and sometimes, with grass fires and exploding ammunition dumps, the Rock appeared to be on fire all over.

The mind and body of man cannot forever stand such strain. Toward the end of April men began to sag; cases of shell shock increased; a few men went out of their minds.

"They took on a haggard expression," Comdr Knoll noted, "but never for a moment did they indicate a loss of hope."

On 24 April, the enemy artillery ranged in on Btry Crockett. 1stLt Otis Edward Saalman, of the U. S. Army, one of nine army officers attached to the 4th Bn, started to Btry Crockett, and a few minutes after arrival found Maj Williams, the battalion CO with a volunteer rescue party.

Maj Williams "personally entered the pit, leading the way, and with him he took a wet sack-cloth, assisting in extinguishing much of the fire which would have soon resulted in igniting the powder magazine," Saalman reported.

On 29 April, the Emperor's birthday, 10,000 shells smashed and thudded into the Rock, tore the beach defenses to shreds, wrecked gun positions, touched off magazines, dumps, brush and "anything else that would burn." And that night two PBYs brought medicine and AA fuses from Australia—a last gesture. Final physical contact with Corregidor was by submarine on 3 May; from then on the Rock was cut off from the outside world. On 2 May—as the end drew near—the enemy located and smothered Btry Geary, which, with Btry Way, (previously demolished) was the most effective battery Corregidor had. At Btry Geary, the 240 mm shells penetrated the magazines; the tremendous explosion hurled the 10-ton, 12-inch mortars a hundred yards away, and great slabs of concrete, tons of weight, flew through the air, smashing down trees hundreds of yards away. Again Maj Williams, a "man without fear," led a rescue party, and despite continued shelling, intense heat and fire, and the possibility of another explosion, "which would probably have killed all the men around," the wounded survivors were saved, and the fires put out.

"Another chapter was added to the glory of the 4th Marines," Lt Saalman commented, and added:

"The conduct of Maj Williams . . . was an inspiring example of courage and leadership, as well as character, honesty and integrity and all other qualities that are needed to make an officer and gentleman as well as a soldier in the service of his country. No words of mine can express my personal feeling and respect toward him and all men with whom I have talked that served under him expressed similar praises.

"During the time I served with him on Corregidor one of his outstanding traits of character was his devotion to the men who were serving under him. During every air raid or shelling by the enemy he always personally saw that all men in his command were provided with protection and in so doing he was constantly exposing himself to danger with total disregard for his own safety. . . ."

But courage alone is never enough.

By the morning of 5 May the Japs had won the battle without ever setting foot on Corregidor. The greatest artillery bombardment in the Orient—probably one of the greatest any area of comparable size had ever suffered—had been effective; the enemy had won the unequal duel and Corregidor's big guns were forever silenced.

Th 4th Marines had suffered 10 per cent casualties, (Marine personnel alone, not including casualties to attached Army and Navy personel).

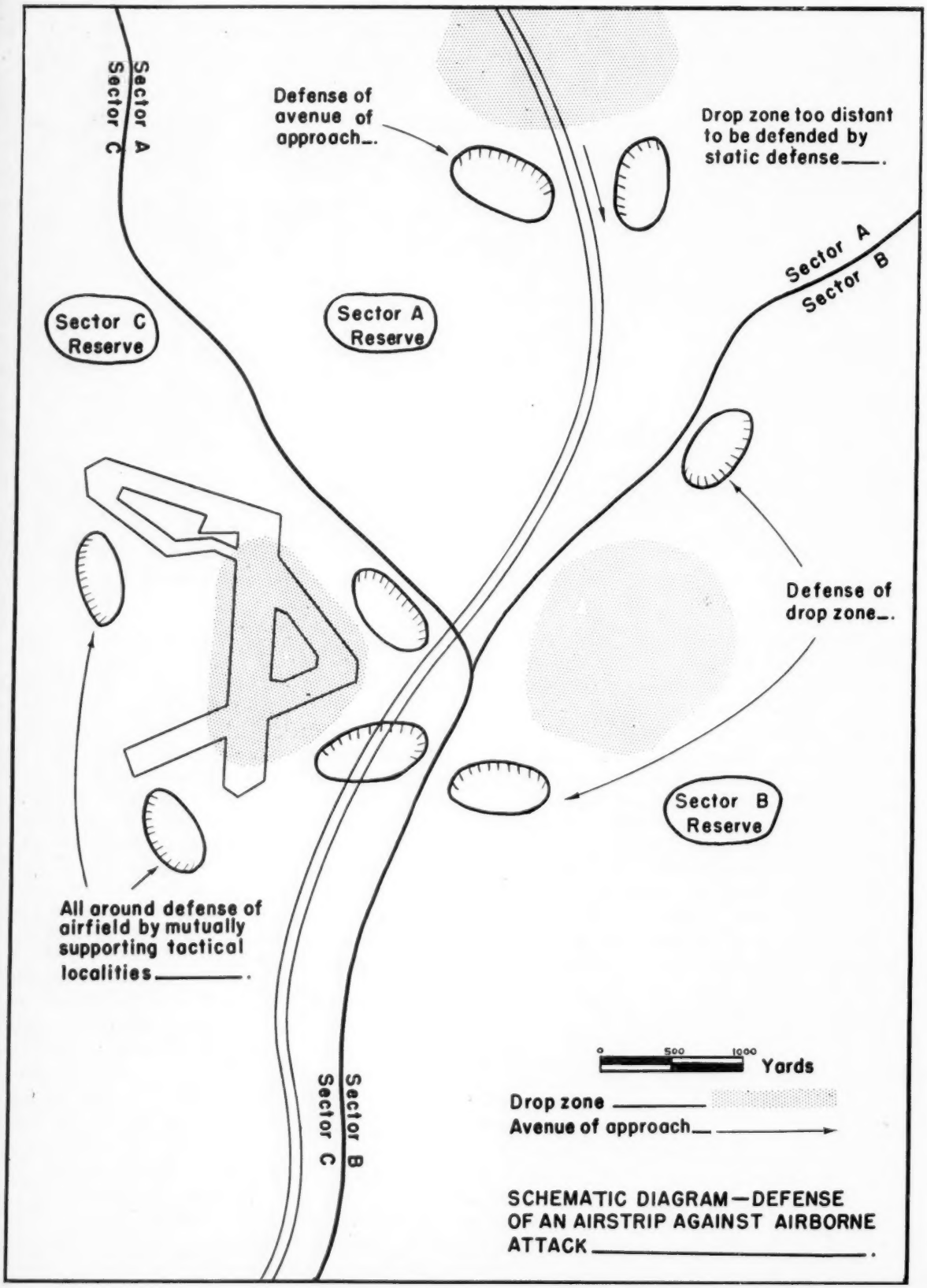
Maj Harry C. Lang, the CO of Co A had been killed; the CO of Co B and one of his officers were in the hospital; three army officers attached to a reserve company had been wounded, and an officer of Co D was wounded.

Before Bataan fell special Marine patrols were used against infiltrated Japs. © LIFE

The casualties, bad though they were in an outfit as small and hetereogeneous as the 4th Marines, were the lesser part of an impossible situation. By 5 May. Corregidor was broken and blasted; the lovely green-capped hills now lay bare and naked, the earth scourged and flayed and ulcered. All structures and buildings in the open were destroyed; in some areas "not a stick, not a leaf" was left; trees "once so dense in some areas that they shut out the sun were reduced to charred stumps"; shell cases from burned out ammunition dumps pocked the landscape. Two more tunnel laterals had been cleared for hospital use and yet the sick and wounded overflowed. . . . The railroad and most of the roads were destroyed—some portions of them literally blasted into the bay; communications except by runner and radio were non-existent. Most of the beach defenses—the barbed wire, the foxholes—were wiped out. Nearly all the beach defense guns were destroyed, and all of the Rock's great batteries were silenced—the mortars, the 12-inch rifles, the 8 and 10-inch disappearing guns, the 155s. The star shells were burned, the searchlights—except for one or two —were wrecked; of the AA guns a few remained, but the fire control instruments were destroyed. The great 14-inch guns on the outer fortified islands were still firing, but except those on Fort Drum, the "concrete battleship," only intermittently. A thousand shells struck the deck of Fort Drum in one day; some fifteen feet of its concrete was chipped away by shell fire during the siege, but its turrets still spoke. On Corregidor, 16,000 shells in 24 hours on 4 May was the culminating blow; there was little left on the Rock—save the Rock itself and men with heart and courage—and on 5 May, there were only three or four days supply of water remaining.

to be continued

The Marine Corps has directed attention to a regulation which prohibits any officer from retaining a commission in the Marine Corps Reserve at the same time that he becomes a member of any naval or military organization, state or federal, with the exception of the Marine Corps branch of the Naval Militia.



SCHEMATIC DIAGRAM—DEFENSE OF AN AIRSTRIP AGAINST AIRBORNE ATTACK.

DEFENSE AGAINST AIRBORNE ATTACK

VERTICAL ENVELOPMENT WAS A FRIGHTENING and magical term during the past war. Newspapers peopled the skies with paratroopers; the Germans swung into airborne action in Holland, Belgium, Norway, the Balkans, and finally wrested the entire island of Crete from the Allies.

Now, as we try to peer into the future, we hear predictions that the infantry of the future must be largely airborne and that entry into combat from the air will be commonplace and normal. It is evident that one question is looming ever larger: How can we defend against an airborne attack?

LtCol Robert E. Cushman

To answer our question we must research the past. To the student of airborne operations it becomes clear that under certain circumstances and by applying certain principles an airborne attack can be successful as can any other type of attack. Conversely, if an airborne attack is not properly made, or if a proper and sufficiently strong defense is employed, the airborne attack can fail or be defeated. Hence as on the ground, attack and defense in three-dimensional warfare have attained a sort of precarious balance in which success can only be grasped by the side which combines a better and stronger application of proper principles with better tactical execution.

In speaking of airborne operations, it may be said that the defense has a shorter history than the attack. The idea of airborne attack germinated in this country during World War I; however peace brought an almost complete termination of everything except the idea in this country. In Russia and Germany, on the other hand, experiments and trials were carried out and maneuvers held. This continued during the nineteen-thirties and operations were planned and men trained during the Spanish Civil War, but because of lack of transport planes the attacks were never executed. Transportation of troops by air was carried out in that war, however. Rapid developments were then made in the organization and principles of employment of airborne troops, and the Germans were ready to use them, and did, when they started the second World War. At that time the defense of airfields, a prize objective for airborne troops, was entrusted to antiaircraft artillery alone. In very short order, the German successes demonstrated that such defense was not sufficient. By the time of the Battle of Crete, the defense was sufficiently strong to cause such high casualties and such difficulty to the German paratroopers that Field Marshal List almost called off the operation after the first day. The main tactical principles of defense against airborne attack began to take on clear form. At the close of the past war we find the Germans defending against our airborne operations and doing so with such skill as to cause high casualties and serious hindrance to the mightiest airborne force the world has seen, the First Allied Airborne Army. It would seem, therefore, that the defense against airborne attack has reached a comparatively high state of development and that the principles have become firm.

We cannot discuss the defense until we have

Vigorous use of highly mobile reserves is the best answer to vertical envelopment

briefly reviewed the salient points about airborne troops themselves. Airborne troops have great strategic mobility and threaten large areas constantly by their mere presence on the enemy side. They are capable of great surprise by reason of their speed, and even when in the air, it is not possible to tell their objective. These troops can envelop vertically the strongest defense line or the most impassable terrain barrier. Airborne troops strike directly at the vitals of the defense; the airfields, communications centers, and the command posts.

Of course, airborne troops also have their limitations; they have great strategic mobility but with present equipment their tactical mobility is low and reduced to that of footmovement once they are landed. Air superiority is an absolute requisite for the landing and continued supply of any airborne force. These troops are extremely vulnerable while in the air and immediately upon landing. They do not have sufficient heavy arms, armor, and supplies to make them capable of sustained independent action. Finally, their operations are subject to the weather and to suitable landing areas.

In studying these capabilities and limitations we see how already they are shaping the defense. Strong defenses will have to be placed in key areas within striking distance of major airborne forces, and some defense will have to be made of all likely objectives. Furthermore, since the air arm is so intimately connected with these operations, our defense will have to be intergrated with air defense. And finally, since airborne troops will normally operate in conjunction with a major effort by ground troops, we dare not weaken our front line forces to any great extent to provide defenses of rear areas.

We note that the defense may be faced by an attack from any direction and that the airborne troops in most types of terrain will have a wide selection of suitable drop zones. We also note that for a short period of time the attacker will literally have one foot in the air and one on the ground and that the initial landings will be attended by disorganization.

WHAT GENERAL TYPE OF DEFENSE IS INDICATED? Careful evaluation of the above factors shows that defensive-offensive action must be employed—the active type of defense. It will in most cases be impossible to place troops at all the places where airborne troops might land, hence we seek to establish local defense forces at the most likely of thes areas. Vigorous offensive action is the best defense against airborne attack, and so we keep a highly mobile reserve to strike the enemy before he can firmly establish himself in the landing area.

From examination of the type of attack with which we are faced we can develop our idea of defensive-offensive action further. We see that we must conduct the defense so as to: *first*, inflict the maximum damage to the attackers during the period when they land and commence reorganization — their most vulnerable periods; *second*, contain the attacking forces and deny them their objective, and; *third*, defeat them by rapidly striking them with a concentrated mobile counterattack force before they can be relieved and while they are still weak in mobility, armament, and supply.

It is apparent that one type of force cannot accomplish these conflicting missions demanded of the defense. We must, therefore, have a judicious mixture: a local defense force available at the point of landing during the attacker's period of greatest vulnerability, and a mobile defense force which can strike rapidly, in mass, upon which we must depend for the complete defeat of the enemy, since with air superiority and a willingness to take losses the enemy can always prevail against local defense forces.

LET US FIRST EXAMINE THE EMPLOYMENT OF the local defense force. We recall that our defensive doctrine prescribes all-around defense of mutually supporting tactical localities and the organization of the defense, as a whole, in depth. Critical terrain features which give us command of such likely objectives as airfields, communications centers, and important command installations must be located. Others which command likely drop zones must be sought.

In selecting the objectives and drop zones which are to be protected, it must be borne in mind that there are certain practical limitations to the employment of airborne troops which will assist us in our task. First, since three to five days of independent action is considered a maximum for airborne forces, a certain limit is imposed on the distance behind the front lines that they may strike: normally not over about 100-150 miles. Of course, the stronger our front line defenses, the less will be this effective striking depth. Second, since the ground mobility of the first waves of airborne troops is low, the drop must usually be made within about three miles of the objective. On the other hand, they will make every effort to land at an undefended point since the very presence of armed men in the drop zone, no matter how uncoordinated, would make a parachute landing hazardous.

In considering the above factors, we see that

Part of Operation Uppercut, this drop was somewhere between Nice and Marseilles.

from a defensive standpoint the ideal situation is one in which the most likely objectives, as well as the most likely nearby drop zones, are commanded by the same critical terrain features. When this does not occur, priority is given to those which command the objectives. In any case, we occupy the terrain features which command the objective and the most likely nearby landing areas and organize them for all-around defense with troops which are small in number but powerful in automatic weapons. Those tactical localities which are close to the objectives are made mutually supporting, while those farther out, organized to command the drop zones, are also organized so that they command the approaches to the objective from the drop zone. This local defense force should have a reserve available for counterattack so that an aggressive defense may be conducted against the attackers during their most vulnerable period.

The area defended by the local force is divided into sectors, the boundaries being so placed that responsibility is not divided for the defense of a drop zone or an avenue of approach to the objective, and so that the objective is made the center of the area and the sectors extend outward and provide "cut-of-pie" divisions. A sector commander is designated to coordinate the activities of all troops and weapons in his area. Most important is the coordination of the fires of the antiaircraft weapons emplaced within the sector and the machine guns of the ground troops, since the former are normally assigned a secondary mission of supporting the defense by firing at ground targets. A further important duty of the sector commander is to see that every man in the sector has a position which he has previously occupied and organized. When possible, infantry organizes the tactical localities and troops of service and technical units "tie in"; however, in order to insure that the reserve is composed of infantry trained in offensive combat, it will normally be necessary for the service units to organize and occupy the tactical localities with assistance and supervision from the infantry.

The second part of the force, the mobile reserve, should be constituted to take advantage of the weaknesses of the attackers. Since the attacking airborne force is restricted in heavy weapons and mobility and must be supplied from the air, our reserve should have a large propor-

tion of armor and must be highly mobile in order to strike the enemy where desired and before reinforcement. Maximum available amounts of air, naval gunfire, and artillery must be used to support the counterattack; however it must be remembered that the primary mission of aviation is to regain air superiority and isolate the battlefield, and that close air support will be contingent upon success in this primary task.

The reserve should be kept concealed in positions outside areas which are likely to be bombed or in which paratroops may drop, so that it can be kept free of the action until the time for counterattack. It may often occur, because of terrain and enemy air superiority, that one reserve for the entire area surrounding an objective is not feasible. In this case the reserve should be broken up and an appropriate part given to each sector. Plans can still be made for the coordinated employment of these sector reserves against the point of main effort of the attack.

WITHIN THIS BROAD FRAMEWORK OF DEFENSE which we have given, are some details which must be covered. First is the relation of the ground defense force to the air defense force. They must of necessity be closely allied because air defense provides the first phase of defense against air borne attack; namely, attack of enemy aircraft in the air by fighters and antiaircraft artillery. In addition, the air defense force supplies warning of air attack and this information must be relayed to the force defending against airborne attack.

The second point is that of command relationships. In combat areas, the commander of a defensive sector or zone of action is responsible for defense against airborne attack within his area. In the rear areas of large commands, however, it is normal for an officer to be designated as commander of a specific airfield, supply point, or other area to be defended. It is often possible and very practicable to designate the AAA commander as the officer commanding such an area. Haste is necessary in preparing these defenses and the AAA commander can assign positions to the local defense force at the same time he puts in his guns and thus immediately coordinate their fire plans. Since AAA is under operational control of the air defense commander for opening and ceasing fire and illumination, and since it is directly in the air warning service circuits as well as possessing organic air warning devices, this arrangement has many advantages. By this method the requirement of closely coordinating the local defense with air defense will be met, and active air defense, passive air defense, and ground defense against airborne troops will all be meshed smoothly together.

The third detail is the organization of the force. In rear areas, the local defense may be made up of all sorts of personnel who normally have other jobs. These troops are formed into a task organization for tactical purposes under the officer designated as local commander of the area. He provides the necessary liaison and communications between this force and the nearest air defense force and assigns each man and weapon a position for defense. It is well to point out here that thought should be given to including an organic infantry component in organizations responsible for defense of lines of communications and airfields. This might well be done in the case of separate engineer units, service regiments, AAA battalions, and similar units.

The fourth consideration is that of supply and signal communications. It is evident that once combat is joined, a series of local and often isolated conflicts will take place. It is necessary to provide each local defense force with a sufficient level of supplies within its positions to enable it to fight until the counterattack can take place. For the same reason, radio will become the primary means of signal communication, although wire should be laid to subordinate parts of the local defense and used as long as possible. For emergency use, a system of visual signals must be prescribed. Signal communication must be maintained by some means for in no other way can the higher commander obtain the information necessary to commit the reserve. It must be stressed that this flow of information is vital and is the continuing duty of all subordinate commanders. The success of the defense will hinge on the performance of this duty.

The last point to be discussed is that of preparation. The entire area must be thoroughly reconnoitered so that defenses may be placed to best advantage with the limited men available, and so that main and local counterattacks may be made by the best possible routes and with maximum speed. Training and rehearsals are imperative. Command post exercises to insure the proper coordination with the air defense force must be held, and rehearsals to train the personnel in manning their positions and counterattacking must be conducted.

THIS ARTICLE WOULD BE INCOMPLETE WITHout a discussion of the conduct of the defense. An airborne attack may be divided into four phases: first, preliminary reconnaissance; second, bombardment by aviation; third, the initial landing

phase during which parachute and glider troops are landed; and fourth, the assault phase during which air landing troops are brought in and the main attack is launched.

During the first phase, passive defense measures are taken by the defense force. Dispersion, concealment, and the occupation of alternate positions are vital.

Depending upon the resources in planes and funs of the defenders, either an active or passive defense may be conducted during the second phase. Assuming that the enemy has a clear cut air superiority, it will be better to adopt passive defense measures and conserve our effort until the critical point when the third phase commences.

Even the unsuccessful defense of Normandy by the Germans was skilled enough to be a serious hinderance to the Allies.

As the attack starts, the maximum active defense against the enemy is undertaken by planes and guns. All transport planes, gliders, and paratroops are taken under fire in the air or as they land. Immediate effort is made to determine the main landing as diversionary drops may be expected. In an effort to come to grips with the airborne troops during their most vulnerable period, small local counterattacks should be vigorously pushed by local commanders against the attackers who are landing, gathering up their equipment, and reorganizing. As more attackers land and the drop and landing zones are consolidated, the local defense forces must make every effort to hold their ground and thus contain the forces landed or prevent enemy progress toward the objective. If it is possible to get the mobile reserve into action at this time, the enemy forces in initial landings should be destroyed before the air landing troops with their heavier weapons and equipment can land. Due to confusion and uncertainty, distances involved, and the speed of the enemy's attack, it will often be impossible to make the main counterattack at this time.

In the fourth phase, the local defense force maintains its positions or fights a delaying action toward the objective until the general counterattack is made.

During the latter two phases the defenders make maximum use of artillery, mortars, self-propelled guns, tanks, and such aviation as can take the air.

To summarize and bring the article to an end, we may say that defense against airborne attacks is provided by aviation, antiaircraft artillery, air warning, and ground defense forces all acting in concert. The ground defense force is composed of a local defense force and a mobile reserve. The defense is conducted along active lines so as to: (1) destroy the enemy while still in the air; (2) destroy the enemy while landing and reorganizing; (3) contain such enemy units as have landed and reorganized, or fight a delaying action toward the objective; (4) defend the objective, and; (5) destroy the attackers with the mobile striking force held in reserve. This conduct of the defense requires aggressiveness; a continuous flow of intelligence up, down, and laterally, and; a prompt, proper, and vigorous use of all reserves. USMC

The Development of AMPHIBIOUS TACTICS in the U.S. Navy

Gen Holland M. Smith (Ret'd)

IN OUR FIRST YEAR OF OFFENSIVE OPERATIONS, the Navy's landing operations doctrine was put to the test of combat and found satisfactory. This was our first lesson; we found that our tactics would work and work for both services in all theaters of operations—in the Southwest Pacific, the South Pacific, the Central Pacific, the North Pacific, North Africa, and Europe. The difficulties encountered in those undertakings were due largely to our failure, in some cases unavoidable, to adhere strictly to prescribed tactics. We had to learn, too, which aspects of the doctrine required emphasis. For example, we learned that the importance of close cooperation between military and naval staffs through the planning, training, and execution of the landing cannot be stressed too strongly. We learned that the logistical aspect of amphibious operations was as vitally important as our assault tactics, and that there was a need for further study and elaboration of the doctrine in this regard. Finally, in the first year, we found the need for new equipment and techniques, especially in communications, to improve our tactics. We were actually relearning much of this; combat confirmed and underscored previous training experience. The answer to many of our problems was more training and better training methods.

The Solomons Offensive

ON 7 AUGUST 1942, THE SOUTH PACIFIC AMphibious Force, commanded by RearAdm R. K. Turner, landed the 1st Marine Division, Reinforced, commanded by MajGen Alexander A. Vandegrift, on Florida, Tulagi, Tanambogo, Gavutu, and Guadalcanal Islands in the British Solomon Islands. The purpose of the operation was to halt the Japanese advance southward and forestall the threat to our thin lines of communication to New Caledonia, New Zealand, and Australia. Indirectly, our occupation of these positions would serve to aid the Southwest Pacific Forces under Gen MacArthur in stemming the enemy's offensive on Southern New Guinea. The Japanese were established on Tulagi as early as April and on Guadalcanal in July.

ViceAdm R. L. Ghormley, the Commander South Pacific Force and Area, had a difficult task. He was directed to capture the objectives on short notice and with the very limited forces and materiel available. Europe had first priority in our war strategy, and the South Pacific was indeed a neglected step-child. The lack of time for training and planning, the lack of adequate naval forces, and the limited number of trained troops available resulted in an inability to achieve, maintain, or exercise air or sea superiority. The expected effect on our tactics was quickly forthcoming. The small landing force did not have adequate tactical support. Logistical support of the troops was even more critically lacking. The enemy could not be isolated. He could and did intervene by air and sea to oppose our effort. He was able to reinforce his ground forces continually. The campaign lasted for six months and until we were able in a long series of bitterly fought naval and air engagements to gain control of the sea and air in the Southern Solomons.

There were three major task forces involved in the tactical execution of the mission. ViceAdm F. J. Fletcher was in overall command of the first two which operated at the objective area. The covering carrier task force, commanded by RearAdm L. Noyes, included three aircraft carriers, one new battleship, five heavy cruisers, one

Initial objective for the 1st Marine Division on Guadalcanal was the airfield.

light antiaircraft cruiser, and sixteen destroyers. The amphibious force, commanded by RearAdm Turner, included 6 heavy cruisers, 2 light cruisers, 15 destroyers, 5 mine sweepers, 13 assault transports, 4 destroyer transports, and 6 assault cargo vessels. Land and tender-based aircraft at New Caledonia, the Fijis, and Samoa, which were available to support the operation, were in a third task force commanded by RearAdm J. S. McCain, Commander Aircraft, South Pacific. The Landing Force, consisting of the 1st Marine Division, less the 7th Marine Regiment on Samoa and reinforced with the 2d Marine Regiment, the 1st Raider Battalion, the 1st Parachute Battalion, and the 3d Marine Defense Battalion, totalled 19,546 officers and men.

The Guadalcanal campaign is historically important as the first major United States offensive operation in the war. It was a significant strategic victory. It was long and costly. It was as much or more of a naval campaign as it was an amphibious or ground operation and was won in the sea and air battles of Savo Island, Eastern Solomons, Cape Esperance, Santa Cruz Islands, Guadalcanal, and Tassafaranga, as well as in the fighting on the ground. In the air, on the sea, and ashore, we came to know our enemy and his tactics, and we learned how to fight in the jungle. Our amphibious tactics were baptized, but it was not initially a baptism of fire. Guadalcanal is therefore important in the history of amphibious warfare, but its lessons and influence on the development of amphibious tactics are limited.

The expeditionary force was mounted in New Zealand and conducted a partial rehearsal of the operations at Koro Island in the Fijis. The actual landings were preceded by scattered naval gunfire at the limited "targets of opportunity." No preliminary scheduled bombardment was, in point of fact, necessary. We enjoyed tactical surprise, and the main landing on Guadalcanal was unopposed. The advance of the landing force ashore was unimpeded during the entire first day, and by the second day, our first objective, the airfield (later called Henderson field), was in our hands. Opposition did develop on Tulagi soon after the landing, and our landings on the lesser islands were opposed. However, on the second day, the landing force had secured all of Tulagi. The early retirement of the covering carrier force for refuelling on the second day made the position of the transports untenable, a fact which was emphasized by our losses in the Savo Island Battle on the night of 8-9 August. Their withdrawal, after landing only scant quantities of supplies, left the landing force in a logistically desperate position, which was only slowly remedied over an extended period.

Some of the logistical lessons we learned were:

1. The limited number of ships which could

be expected for amphibious operations required a careful screening of landing force equipment. No organizational equipment could be included in assault shipping.

2. An increased number of troop transport quartermasters were needed to effect most efficient loading plans and embarkation.

3. Well-trained boat crews were required for rapid unloading and landing at the target. In this regard, the necessity for effective control and efficiency in the ship-to-shore movement was reemphasized. The more quickly supplies could be landed, the sooner the transports could be dispatched from their vulnerable positions at anchor and the stronger the landing force could become to fulfill its mission ashore.

4. Unloading landing craft at the beach and moving the supplies to the troops inland required a substantial force of specially trained and organized service troops. There was a shortage of shore party personnel at Guadalcanal.

5. A careful plan for resupply shipping and an echeloned schedule was needed to maintain the landing force ashore for any but the most limited operations.

THE NAVAL AND AIR FORCES WERE ENGAGED throughout the campaign in combating enemy attempts at intervention and reinforcement. The joint support rendered the landing force was consequently of a most limited and primitive nature. No gunfire was delivered in close support of troops and close air support was handicapped by the fact that the controlling agency was afloat, many miles from the scene of ground action. Air-ground communication was almost nonexistent, and there was the problem of identification of friendly troops by our own aircraft, one which persisted to some degree during the entire war. It was apparent that for coordinated and effective fire support a centralized controlling echelon was necessary. The need for an amphibious flagship with ample communication facilities was already felt. Lighter, stronger, and more extensive communication equipment was another definite need.

The operation demonstrated that a more specific treatment of the ship-to-shore movement in our landing operations doctrine to include control and communications would improve that portion of our landings. Boat crews showed the need for intense training. There was room, too, for improvement in landing craft salvage procedure. The landing force commander recommended that some landing craft be maintained at the objective and held available to him for employment where required in connection with operations ashore. The LVT "demonstrated a usefulness exceeding all expectations." It was used to tow and carry equipment and as a ponton for temporary bridges, but it was not considered or employed tactically.

Gen Vandegrift in his final report on the Guadalcanal operation suggested that the best efficiency could be achieved in future operations with the organization of a permanent amphibious force, consisting of ships and troops necessary to undertake landing operations. Such an organization would have the advantage of frequent joint operational training, and its component elements would together benefit from common experience in combat. Although such an organization was never possible, every attempt was made during the conduct of the Pacific war to employ where possible in successive operations the same commanders, troops, and ships.

Makin Island Raid

TEN DAYS AFTER THE LANDING AT GUADALcanal, another amphibious operation of a different type was undertaken over a thousand miles away in the Central Pacific Area. At 0300 on the morning of 17 August 1942, 225 officers and men of the 2d Marine Raider Battalion, commanded by LtCol Evans F. Carlson, disembarked from the submarines *Nautilus* and *Argonaut*, which with the landing force were under the overall command of Capt J. M. Haines, USN, and landed in a surprise assault from rubber boats at 0500 on Makin Island in the Gilbert Group at the Equator. Part of the battalion was reembarked on the night of 17 August and the remainder on the following day. The operation was conceived as a diversionary raid and achieved its purpose. The enemy was distracted from his defensive operations in the Solomons by this threat in a different sector. We gained information on which to base our offensive campaign in force in that area 15 months later. The Japanese garrison of approximately 150 troops was destroyed by the raiding force, and all major enemy installations were destroyed or severely damaged. These included one transport vessel, one patrol vessel, two seaplanes, the radio station, and considerable quantities of gasoline, supplies, and equipment. Our losses were rather heavier than anticipated and amounted to approximately 30 per cent of the raiding force. The raider battalion trained at Midway and at Oahu in the

Hawaiian Area in night landings from submarines. Loading plans, surf, and not altogether satisfactory communications made control in the ship-to-shore movement difficult, and a reorganization had to be made on the beach. Gunfire support was provided by the *Nautilus*, which succeeded in sinking the two enemy vessels, but it was not equipped with high capacity bombardment ammunition. Operations ashore were not pursued at all times with the offensive spirit so necessary in operations of this nature, and the result was that, at the end of the first day, one of rather stabilized activity, the remaining enemy force was overestimated by the battalion commander. A costly attempt was made to reembark the battalion that night through heavy surf. The force which remained ashore the night of 17-18 August discovered that few enemy actually had survived the first day's fighting, and it was able consequently to complete the demolition of Japanese installations and reembark at its leisure. In the Navy's first combat trial of a submarine-borne landing force, we learned that submarines were suited to troop transporting missions, and that rubber boats were suited to raiding missions. The raider battalion learned valuable lessons for future missions of this nature. Radar showed its value in spotting enemy aircraft and as an aid in navigation. The need for more efficient portable radio equipment, apparent also at Guadalcanal, was demonstrated. It was concluded that plans for a similar undertaking should be prepared with more flexibility unless intelligence was accurate, complete, and detailed.

Dieppe Landing

TWO DAYS AFTER THE MAKIN LANDING, another amphibious raid was undertaken—but by a far larger force and in a far distant theater. On 19 August 1942, (Greenwich Central Time), a combined force of Canadians, Fighting French, Americans, and English landed under British command at six beaches in the vicinity of the French channel port of Dieppe in what was the most extensive amphibious reconnaissance in force of the entire war. However, no United States naval forces participated. It was nonetheless of considerably more interest tactically than the Navy's two previous Pacific landings. It was an opposed landing. It was a test of *combined* (i.e. involving the forces of two or more allied nations as opposed to "joint" meaning Army and Navy cooperation) operations procedure, organization and staff functioning. It provided a graphic preview of the invasion problem facing allied planners. From it tactical lessons were learned which were of value to all allied amphibious forces. The difference between British and American amphibious doctrine were clearly set forth in the conduct of the raids. Finally, prisoners were taken, enemy forces and installations were destroyed, and the raiding forces obtained valuable intelligence on the enemy coastal defensive organization and tactics.

THE PRIMARY PURPOSES OF THE DIEPPE RAID were to test German defensive strength and tactics on a heavily defended shore line and to gain experience, which Prime Minister Churchill, in referring to the landings, called "an indispensable preliminary to full scale operations," in combined operations techniques for large forces. Planning was under the direction of ViceAdm Lord Louis Mountbatten, Chief of Combined Operations. His headquarters had previously planned and directed the smaller destructive Commando raids against Vaagso and Lofoten in Norway and St. Nazaire and Boulogne in France, but had never before Dieppe undertaken a mission of comparable magnitude. The forces involved numbered between 10 and 15 thousand and included Commando Three, commanded by LtCol Durnford Slater; Commando Four, commanded by LtCol Lord Lovat, a Royal Marine Commando; the 2d Canadian Division, commanded by MajGen J. H. Roberts; and small American and Fighting French detachments. They were trained and rehearsed in the United Kingdom and dispatched in a large flotilla of landing craft for the shore-to-shore movement across the 64 miles of English Channel with a convoy of British destroyers and the greatest umbrella of allied air cover yet employed. Four preliminary landings were made at 0450 by the Commandos and elements of the Canadian Division. Commando Four landed at Varengeville, west of Dieppe, accomplished its mission of destroying a German 6-inch howitzer battery of 12 guns, which flanked the main landing beaches, and quickly reembarked. Commando Three had been assigned the mission of destroying an identical battery at Berneval, flanking Dieppe on the east. Its landing craft were discovered by a German coastal convoy which included antiaircraft ships, heavily armed trawlers, and E boats, and all but one of the landing craft were destroyed. The 20 men in this one boat, consisting of runners, communicators, and mortar men and com-

At Dieppe the British had excellent air cover and landing equipment but depended too much on Commando-like tactics.

manded by Maj Peter Young, landed, advanced to the vicinity of the hostile battery position, and, with 11 rifles, 6 submachine guns, 2 pistols, and one 2-inch mortar, succeeded in neutralizing the German guns for four critical hours before withdrawing and reembarking. Two Canadian elements, the Royal and South Saskatchewan Regiments landed in other diversionary attacks inside the Commando beaches and between them and Dieppe at Puits on the east and Pourville on the west respectively. Both forces encountered stiff opposition ashore. The Puits regiment was opposed for 20 minutes prior to landing by the German E boats which were finally driven off by British destroyers. All tactical surprise was lost, and the landing was vigorously opposed. None of these preliminary landings were preceded by air or naval gun bombardment, nor was any direct support provided after these landings were made. Preliminary air operations for the Dieppe Raid consisted of cannon and strafing attacks against beach defenses and known installations and positions in the Dieppe vicinity. U. S. Army Air Forces B-17 bombers attacked nearby Abbeville during the raid. The aerial phase of the raid consisted primarily of a great air battle between the British and German fighters, which raged overhead throughout the landing. The British succeeded in flushing the long hidden enemy fighter strength in western Europe, in keeping it off the landing forces' back, and in destroying 275 enemy planes. The main landings at Dieppe were preceded by a limited destroyer and mortar gun boat bombardment and covered by smoke screens. Later smoke screens were laid by aircraft during the heavy fighting in the town of Dieppe and proved their worth many times. The assault waves in the main landing were boated in tank landing craft, and tanks accompanied by engineers and infantry formed the landing force. The tanks were poorly suited to the task of fighting through the narrow streets of Dieppe, which were lined with reinforced and heavily fortified houses and strong points. Losses were very heavy. After nine hours of battle, the landing force withdrew and reembarked in those landing craft which had not been sunk. Virtually all tanks landed were abandoned ashore. The results of the operation were the loss of 98 allied planes, one destroyer sunk during the evacuation, many landing craft sunk, and 50 per cent casualties for the whole landing force.

The most important lesson emphatically relearned at Dieppe was that it is fatal to send a boy to do a man's job. The force assembled for the raid against a hostile shore known to be heavily defended was manifestly inadequate to the task. True to the tradition of the Commandos, which was a direct heritage of Gallipoli, the entire success of the landing depended on achieving surprise in the preliminary landings. No provisions were made for meeting any other contingency which might arise. Only one preliminary landing was effected with surprise, and the neutralization of the flanking mortar batteries resulted from an act of heroism which no sound commander could afford to expect. Previous commando raids had fortunately enjoyed surprise and had tended to substantiate the British belief in surprise as the key to amphibious success. The U. S. Navy doctrine that no frontal assault should ever be attempted without overwhelming close naval gunfire and air support was heartily reaffirmed at Dieppe. Naval gun-

fire might well have been employed to destroy enemy defenses on the flanks and in the rear of the landing beaches, and close fire and air support would undoubtedly have reduced the landing force casualties. The British failure to employ any volume of gunfire support gained them nothing and cost them much.

THE DIFFERENCES BETWEEN OUR AMPHIBIOUS tactics and those of the Commandos go far beyond the varying values placed on shore bombardment and surprise results. British planning, organization, and training emphasized the precise execution of different assigned tasks by small units in accordance with a rigid timetable. The success of the entire mission depended on the accomplishment of each component task. Each unit was briefed only to do its own particular job and no other. Success further depended on such variable factors as weather and hydrographic conditions, and implicit faith was placed on intelligence concerning enemy defenses and dispositions. Our experience has shown that the manifold complexities and variables in landing operations require above all else flexible planning. Every possibility must be considered and provisions made to meet them all. Units must be trained to be resourceful and be adequately briefed to permit them to contribute most effectively to the overall effort if their particular mission cannot be carried out. U. S. Marines trained in this manner have been found equal to all amphibious missions from raids to invasions. To sum up the experience of Dieppe which was applied in later landings, the British learned:

1. That military and naval cooperation can always be improved.

2. That most effective joint planning can best be achieved at one joint headquarters.

3. That planning for landing operations must be flexible.

4. That the factors of weather and hydrography have a vital effect on the conduct of landing operations and must be carefully scrutinized in planning.

5. That wherever possible plans for assaulting defended beaches should include a maximum preparatory and supporting bombardment by all naval guns and aircraft available. In any event, full advantage should be realized from all supporting arms available.

6. That tactics for landing on a hostile shore should always be premised on the necessity for assault, and, whether or not the attack is in fact opposed, all planning, organization, training, and deployment should be directed to meet that eventuality. The assault should be conducted initially with the minimum force necessary to assure success deployed on the broadest front possible. The width of the front should be determined by the ability of the commander to control his force and the character of the gunfire and air support provided. A considerable force should be held in reserve afloat prepared to support and exploit the initial landing(s) of the assault elements.

7. That an important kind of naval gunfire support can be provided by small, close-in supporting gun and mortar boats accompanying the leading waves in the approach to the beach. The lack of such support had also been sorely felt at Gavutu and Tanambogo in the Solomons.

8. That landing force assault equipment should include light, mobile artillery and high-velocity self-propelled weapons (e.g. the 75 mm pack howitzers employed by the Marine division and self-propelled guns).

9. That smoke has many valuable uses in landing operations.

10. That improved communications techniques and equipment would benefit ground operations and joint air-naval-and ground tactics.

11. That airborne troops might well be employed in conjunction with amphibious forces.

12. That landing force training should include repeated ship or shore-to-shore and night exercises.

Invasion of North Africa

THE ALLIED INVASION OF NORTH AFRICA ON 8 November 1942, involving three separate landing operations against an 800-mile coastline by a total landing force of 107,000 men, was the first large-scale test of our amphibious doctrine, the first Allied invasion in the European Area, and the opening phase of our European amphibious offensive. It was the largest ship-to-shore operation yet undertaken. The plan was first considered in Washington in January 1942 in conferences between President Roosevelt, Prime Minister Churchill, and their Combined Chiefs of Staff, but there were insufficient forces and materiel available at that time for the undertaking. Further study was made in June, and the decision was arrived at in London in July.

North African beaches were congested, the result of inadequate preparation.

The invasion was to be coordinated with the attack of the British Eighth Army westward from the El Alamein line and had as its purpose the opening of the Mediterranean and the removal of the German threat both to Suez on the east and to the Moroccan coast and Dakar on the west. The capture of French territory would further provide a setting for the re-establishment of a Free French Army. American and British forces, mounted both in the United States and the United Kingdom, were to launch three major attacks: one against the French Moroccan port of Casablanca on the Atlantic, and the other two against Oran and Algiers on the Mediterranean. Many new vessels and landing craft, still a highly critical item in our production schedule, and very recently trained crews were employed in the landing. The completion of those vessels and necessary training delayed the operation until 8 November. The overall Allied and unified command of the invasion was given to LtGen Dwight D. Eisenhower, USA, who directed the planning from his joint headquarters in London. Adm Sir Andrew Browne Cunningham, RN, was the Allied Naval Commander. Gen Eisenhower oppened his command post at Gibraltar on 5 November. It should be noted that all land-based air support for the invasion had to be staged through that one base.

Planning for the North African operation was complicated by the political factors involved. The extent of Vichy French-German cooperation and the extent of the Vichy government's control of the North African colonies and the many racial and local differences in North Africa combined to make any estimate of colonial opposition to our landing highly conjectural. Gen Eisenhower wished to avoid conflict with the French and if possible effect an unopposed landing. However, the necessity for security prevented his giving any wide-spread advance warning of our landings.

The Morocco attack force was organized, trained, and dispatched from the United States. The landing force involved included the 3d Infantry Division, the 2d Armored Division, and the 9th Infantry Division, less a regiment, all under the command of MajGen George Patton. The Naval attack force was under the command of RearAdm H. K. Hewitt. This expeditionary force sailed from the United States on 24 October and landed at 0400 on 8 November at three points in the vicinity of Casablanca. The main landing was made at Fedala, 24 miles north of Casablanca. A secondary landing was made without initial resistance at Port Lyautey, 65 miles north of Casablanca, and a third landing was made from destroyers 125 miles to the south, at Safi. Coastal defense batteries and the guns of the French battleship *Jean Bart* opposed our landing on D-Day. French naval units, including eight submarines, two destroyer leaders, five

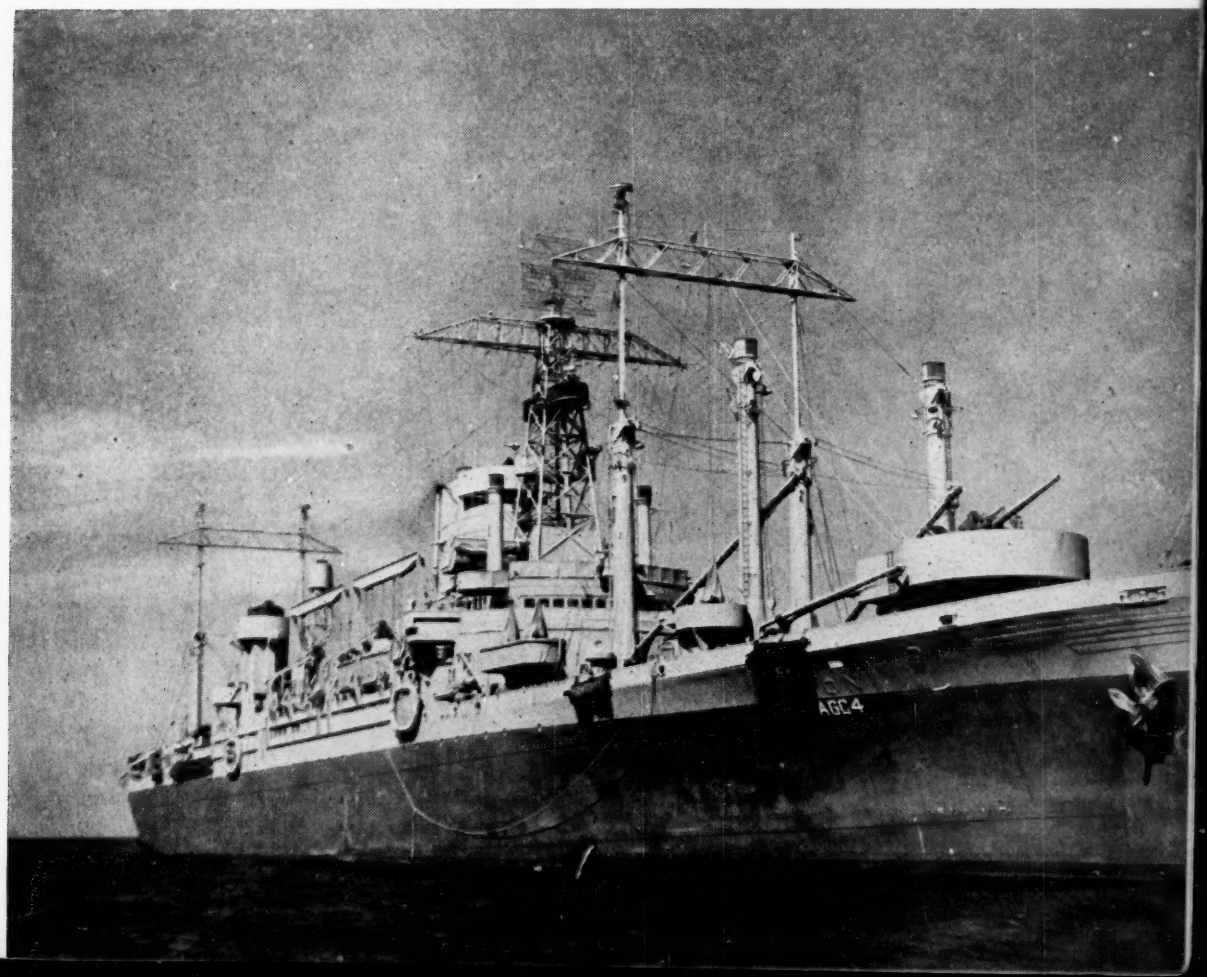
destroyers and a light cruiser, attempted a sortie from the port and were either sunk or beached as a result of our naval gunfire.

The Oran attack force was organized, trained and dispatched from the United Kingdom and consisted of United States troops and British naval vessels. The Army units involved included the 1st Infantry Division, half of the 1st Armored Division and Corps troops under the command of MajGen Lloyd Fredendall. This landing force landed at 0100 on 8 November.

The Algiers attack force was also mixed and included British naval units and British and American landing forces. The landing force was under the command of LtGen K. A. N. Anderson of the British Army and included British Commando units, two United States regimental combat teams, one from the 34th Infantry Division and the other from the 9th Infantry Division, and a United States Ranger battalion in the assault under the command of MajGen C. W. Ryder, USA. This unit was landed at 0100 on the 8th. The British First Army landed after the beachhead was secured. One American Transport Division was included in the naval force; two of its vessels were torpedoed. There were three covering naval forces, one of which was commanded by RearAdm R. C. Giffen, USN, as well as airborne troops which had to be flown 1,500 miles to the objective. Complete strategic surprise was achieved in the invasion and within 48 hours, we had won all of our initial objectives, which included both facilities and airfields. By 11 November, an armistice had been signed with the French and the amphibious phase of the operation was completed. British and American detachments landed eastward at Bougie on the 11th and at Bone on the 12th.

The invasion did not encounter heavy resistance. It was successful both strategically and as

The *Ancon* was the first specially equipped AGC or amphibious command ship.



amphibious experience. The doctrine was again proved sound and the chief conclusions drawn from the undertaking were that we must strive to improve our application of the doctrine, that we must improve our training methods, and that the forces involved needed more training and experience before they could realize the full effect of the doctrine in an opposed landing. Some changes were indicated as a result of the operation. We made the usual mistakes which can in general be attributed to lack of training and experience. We landed at the wrong time and on the wrong beaches, a result of deficient control. We landed with lights and noi es, a result of bad discipline. We abandoned landing craft, which were left stranded at many points in the landing area, another result of bad discipline. The landing beaches were congested, a result of lack of training and of inadequate techniques and equipment for unloading and beach clearance.

As a result of the operation, it was recommended that a standard pattern for planning amphibious operations be adopted which would include the following steps: (1) basic training; (2) tactical planning; (3) operational training; (4) full-scale rehearsal.

No rehearsal was possible for the North African invasion. In regard to our supporting arms, there was again no centralized controlling agency, and it was discovered that a combatant vessel of the *Augusta* type made a poor flagship for amphibious operations. Again the need was felt for an amphibious command ship, similar to the British *Bulolo, Largo,* and *Hilary,* one of which had been used at Madagascar the previous May, with adequate communication facilities to coordinate the activities of the many participating elements. One such ship, the *Ancon,* was used at Algiers. The need for an aerologist at the objective area was strongly felt. A special naval gunfire target map was recommended. It was recommended that destroyers which had been assigned gunfire support missions not be used for control purposes in the ship-to-shore movement. It was recommended that a landing craft similar to the LCC or LCI be used for guiding the waves beyond the line of departure. Air elements provided antisubmarine patrol, spotting missions for gunfire, and reconnaissance flights. Air-ground communications again proved inadequate and means of identification of friendly troops by aircraft were unsatisfactory. The depth bomb proved itself suited to bombing missions against exposed troops ashore. Air liaison parties were attached to each regimental combat team. This was the first step; later air liaison teams were attached to each battalion and all teams were coordinated through a centralized controlling agency—Commander Support Air. Aerial and submarine photographs and silhouettes proved a valuable aid in the ship-to-shore movement.

The LCVP was considered to be an improvement over both the LCV and the LCP. Rope debarkation nets proved better than metal ones. Rail loading of Davit-lowered LCVPs was effective. It was realized that the time involved in forming and dispatching waves from the transport area could only be reduced with training, experience, and constant time studies. Some method of controlling landing craft at night was needed. Communications aimed at speed rather than security and plain language voice transmissions were used in North Africa. The shore party again lacked the personnel, training, and organization to fulfill its function. What was needed was a specially trained service organization adequately manned and equipped. The boat salvage functions of the beach party could not be fulfilled because of the lack of personnel and engineering equipment. Military police were needed for guarding unloading areas. Palletized equipment greatly aided rapid unloading and ponton barges were used to good effect.

IN JANUARY 1943, AS A RESULT OF THE EXperience gained in maneuvers conducted immediately prior to the war and of the lessons learned at Guadalcanal and North Africa, the Commander-in-Chief of the U. S. Fleet published a supplement to the landing operations doctrine already in existence. These general instructions for transports, cargo vessels, and landing craft of the amphibious forces set forth in detail a single standard procedure for the ship-to-shore movement. It covered characteristics of landing craft, debarkation, rendezvous, landing craft organization, control, beach party functions and communications, and resulted in a marked improvement in these phases of landing operations.

to be continued

Automatic Weapons

continued from page 14

This is important because single-shot tickling signifies adequate control of the length of the burst, and permits delivery of a few single shots for adjustment instantly followed by bursts of three, five, or ten shots for effect.

Assault fire or marching fire was used considerably both in the ETO and Pacific. The BAR (somehow the two-pound bipod A2 frequently was "lost") and even the 36-pound A6 were used for this purpose, not to mention M1 rifles. With a belt-fed LMG of BAR A2 weight, fast semiautomatic fire offers excellent possibilities for effective assault fire. If the lads want to dish out an intense burst and not be too long exposed in the process, a high cyclic rate is preferable. The fact is that a number of enterprising characters jazzed up the aircraft gun, M2, with shoulder rest, sling, and bipod. A story on one of many such conversions appeared with pictures last year in the MARINE CORPS GAZETTE. A special feature was the cyclic rate, 800-900 without muzzle booster, 1200 with booster. Thus in actual combat a high rate was found to have advantages. A similar gun was developed by the Ordnance Department and tested by the AGF board.

Although the writer has found some apparent vindication from combat reports for almost every conceivable armament proposition (some say yes, some say no), at least several worthy authorities stated from experience that the Kraut MG42 gunners were very hard to locate because their intense bursts were of such short duration; that the sound of the 1200-1500 rate had a decided effect upon the morale of troops exposed to such fire.

To conclude this phase of the discussion it is suggested that light belt-fed machine guns of the future, weighing roughly 18-22 pounds, will require a basic cyclic rate for reliable service functioning of 800-900 R.P.M. minimum; that this rate coupled with semiautomatic control offers a most effective combination for practical use and efficient performance in the accelerated combat of the future. The light belt-fed gun demands at least 200-300 R.P.M. extra above the basic rate of 600 as a margin for service abuse.

f. *Endurance and functioning*—

The future squad LMG should prove rugged and mechanically reliable within reason. Because of its light weight it can hardly be expected to perform equally with the heavy gun as to endurance and under abuse. Even the most modern Ford, Chevrolet, or Plymouth can not stand up to the endurance of the traditional Rolls Royce.

The heavy guns were used to pound out long barrages at 50-100 shots per minute. The light gun of the future must fire intensely for short intervals, followed by relatively long periods of little if any firing. The great increase in fire power comes from the added number of guns per combat unit plus increased feed capacity plus deliverable rates of fire plus closer support. The great increase in mobility comes from the greatly reduced weight of each gun and its adaptation to the squad. *This means more target opportunities for more total fire power.* Comparative endurance and functioning must be evaluated with these factors in full view. Otherwise the using arms should simply require a new improved tripod gun of 35 pounds on a 40-pound mount. Such an impractical monstrosity in terms of future combat requirements could most decidedly be designed to outperform any similar existing types, however.

In other words it is submitted that future infantry combat organizations, if they are to be effective, must echelon their automatic weapons chiefly within the squad and platoon. The day of the conventional battalion and company or heavy machine gun is rapidly passing. Recoilless artillery pieces, improved rocket launchers, and even improved mortars are taking the *heavy* machine gun's place. Therefore the endurance and functioning of the light machine gun for the future must be judged and evaluated as that of a *squad* automatic, perhaps more as if it were simply a belt-fed auto-rifle, also adapted for mounting on a light tripod as required.

Dektyarov (Russian) light machine gun

g. *Barrel changing*—

The following light machine guns have readily removable barrels which can be easily changed within 10 to 15 seconds:

German MG34
German MG42
Jap Type 96-99
Italian Breda
British Bren
Chinese ZB
Russian Degtyarov
Mexican Mendoza
Johnson (developed in U. S. A.)

The following have fixed barrels not removable by the soldier:

U. S. BAR M1918A2 (M1918)
German FG42
Jap Nambu M1922 (obsolete)
Lewis gun (obsolete)
Benet-Mercie M1909 U. S. (obsolete)

The following have barrels not readily removable, requiring disassembly of various parts, and proper adjustment for correct reassembly:

U. S. Browning M1919A4 (M1917A1 heavy)
U. S. Browning M1919A6 (also M2 aircraft)
Madsen (Denmark, Brazil) (Barrel coupled with barrel extention and breechblock assembly removable from rear of receiver, requiring reassembly of another frame and breechblock assembly.)

Hotchkiss (Japanese) heavy machine gun M1932

The statement has sometimes been made in the U. S. service that quick and easy barrel change serves no useful purpose because no one ever changes LMG barrels in combat. This pronouncement should be considered in the light of the fact that none of the U. S. Browning guns (auto-rifle, machine guns) has a quick-change barrel.

The Germans changed barrels frequently. Wherever you can bring up ammunition you can bring up barrels. One 50-round belt nearly equals the weight of a light machine gun barrel. There is little use firing on and on with a worn-out barrel. In any case there can surely be no harm in having a quick-change barrel. It is a U. S. requirement for a light machine gun.

The Rifle

THE SQUAD OR BASIC INFANTRY RIFLE OF THE future will in all probability be at least semiautomatic. It will have a short utility knife bayonet and a grenade launcher. It may have a compensator and flash reducer. This weapon should weigh about 8 to 10 pounds. In all probability the magazine capacity will be 15 or 20 rounds.

The principal question is whether this weapon should be capable of full automatic fire as well as semiautomatic. In studying this problem the M2 carbine may be considered. The M2 is a full and semiautomatic carbine fired from a closed bolt with a 30-round magazine. The latest M1 semiautomatic rifle (T20E2) can similarly fire full automatic from a closed bolt and a modified BAR 20-round magazine can be used instead of the 8-shot clip.

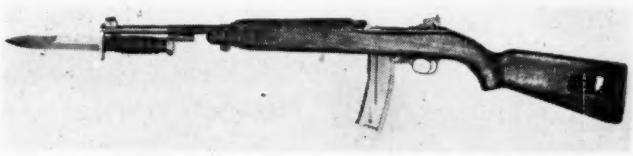
Such a weapon represents the equivalents of an M1918 auto-rifle weighing some five or six pounds less (10.5 pounds versus 16 pounds) and firing from a closed bolt. The cyclic rate is over 700 RPM, so a 20-shot burst can be fired in less than two seconds.

If a one-pound bipod is included with this type of rifle and the rifle is rarely fired on full automatic except from the bipod, then full automatic fire control may serve some useful purpose.

a. *Burst control*—

Despite the use of compensators very few average marines or GIs will be able to hit the ground, much less any specified area, with a burst. The auto-rifle will run away with them. The bullets will go into the air and the net result will be

equalled by discharging loud blanks. People who have made a business of practicing such full automatic fire can give impressive demonstrations from the shoulder and hip, but remember this is to be a basic squad weapon. Incidentally, the conventional rifle stock is badly adapted for automatic fire. Old-timers will recall that the Marine Corps used the M1918 BAR in the 8-man squad of pre-war vintage. They will recall that the BAR was habitually fired on semi-automatic, rarely if ever on "auto." It weighed 16 pounds. How about a 9-pound auto-rifle? Ammunition scattered off into the air will really be wasted. Most troops can't even control a submachine gun effectively, let alone a 10-pound auto-rifle. Extensive training, however, would make auto-rifle fire most effective.



U. S. carbine, automatic, M2

b. *Hot chambers, cook-offs—*

If three or four 20-shot magazines are fired on automatic the barrel chamber will have become dangerously hot. This condition will (1) create serious extraction difficulties due in part to raised pressures and (2) tend to cause cook-offs or accidental discharges due to heat. Locking the safety in no way controls cook-offs. Rifles such as the M1 are not well adapted for firing from an open bolt on full automatic chiefly because the breech is entirely exposed when the bolt is open.

c. *Fire effect—*

The semiautomatic rifle proved to be very effective in World War II as an agency to produce an effective volume of fire. People pumped off eight rounds, then eight more, and so on. The limitation on fire effect was not by any means due to lack of full automatic fire but rather to the magazine capacity of eight shots.

With any reasonable basic training an average man can fire one aimed shot every second into a 12-15 inch circle at 100 yards or a 3 to 4½ foot circle at 300 yards. He can certainly keep on a 6 x 6 foot target frame at 300 yards firing two shots every second, probably much better than that. Twenty shots have been fired in 11 seconds at 100 yards with 16 shots hitting a six-inch bullseye and all shots within a six-inch square. It is possible.

All of the above, however, is with the provision that no time is taken for reloading. On the *average* it takes five seconds to pull from the belt and load an M1 clip or a BAR magazine. Assuming five seconds as the norm, suppose the M1 rifle is fired at one shot per second for eight shots or 8 seconds plus 5 seconds which is 13 seconds. Allowing two seconds to re-lay the rifle this means 15 seconds per eight shots, or 32 shots per minute, actually fired at 60 per minute per eight shots.

Suppose the same rifle has a 20-shot magazine. Add 5 seconds plus 2 seconds for re-laying which gives 27 seconds. This means an actual delivered rate of 44.4 shots per minute, or a 40 per cent increase in effective fire.

At two shots per second the time is 4 seconds plus 5 plus 1 (for re-laying) or 10 seconds per eight shots fired or 48 shots per minute delivered. With the 20-shot magazine the time is 10 seconds plus 5 plus 1 or 16 seconds per 20 shots or 75 shots per minute delivered. This means a 56 per cent increase in effective fire. Most important is the fact that the fire (fast semiautomatic) is highly effective.

In conclusion the optional feature of full automatic on a 20-shot future semiautomatic might be useful on certain occasions, or in the hands of intensively trained experts. Otherwise it is believed that such a feature in a pure basic infantry rifle is misleading and ineffective. Full automatic fire is primarily supplied by squad machine guns, these being weapons especially adapted and designated for such fire, whereas delivery of single aimed shots remains the basic function of the rifle.

The problem of ammunition supply in the case of full automatic fire from the basic rifle need only be mentioned in one aspect. Assuming automatic fire will generally prove ineffective due to lack of control by average little-trained infantrymen, then delivered automatic fire rates of 150 to 180 shots per minute may unprofitably exhaust the individual's ammunition. (NOTE A: It requires quite a few hundred rounds fired at a maximum semiautomatic rate to approach serious extraction trouble or cook-offs from a closed-bolt semiautomatic.)

The "Holster-Carbine"

THE M1 CARBINE PROVED AN EFFECTIVE TYPE of weapon tactically during the war. The folding-stock model was especially practicable. Assuming further mechanical improvements in a carbine mechanism and a 20-30 shot magazine, a holster-carried "carbine-pistol" with 8 to 10-inch barrel, not necessarily full automatic, would prove indispensable for combat personnel not primarily armed with the rifle. An essential feature is the adaptability of the weapon for shoulder holster or belt carrying and for operation from the hands as a pistol or from the shoulder as a carbine.

The Pistol or Revolver

SEVERAL ARTICLES HAVE APPEARED RECENTLY in the GAZETTE, AMERICAN RIFLEMAN, and one by the writer in ARMY ORDNANCE, all concerning the military handgun.

From the writer's observation and experience, such as it has been, the U. S. M1911A1, caliber .45, is the most reliable on the list of automatic pistols. The .45 cartridge is especially favorable for a recoil-operated mechanism because of the momentum it develops. Some decided improvements affecting functional reliability can be made in the M1911A1. The double-action feature of the over-rated German P38 Walther is not altogether worth the complications entailed. Only a revolver can *assure* you of instantly remedying a dud cartridge stoppage. The double action Walther is really a snare and a delusion if the primer is incurable. Primers sometimes are, especially in wartime manufacture. The Walther P38 offers no special cure for ejection failure due to a weak load.

The pure pistol or revolver, fired from one hand only, is a ten to twenty yard man-stopper weapon. People like Walter Walsh and Harry Reeves, *et al*, are relatively rare. On the average, including GI shooters, it is more difficult to obtain hits with the automatic pistol than with the revolver. Why? The angle of the grip on the conventional pistol is unnatural. The revolver grip angle is not.

Pistol and revolver cranks can argue till they burst, but the fact is that the revolver is better adapted for an average shooter than an automatic pistol because the angle of the grip is more natural on the revolver, hence the line of thrust is more natural on the revolver, hence the line f thrust is more nearly along the axis of the arm and wrist. Trigger flinching therefore causes less damage to the aim with the revolver.

To achieve a natural angle of the grip in a pistol precludes assembly of the magazine in the handle. Instead the magazine would have to be ahead of the trigger guard, as on the old Mauser military pistol in which nevertheless the Germans unrealistically designed a perpendicular grip. The best grip angle, measured from the perpendicular, should be at least 50 to 65 degrees.

In all probability both automatic pistols and revolvers will continue to be used and improved models developed. There are decided advantages, especially greater fire-capacity, in a magazine-fed automatic arm, whereas the revolver is essentially simpler and somewhat more reliable though less compact.

Conclusion

AUTOMATIC WEAPONS APPLY "FIRE POWER." The term "fire power" is in many respects most unfortunate. Power means nothing if it is not effectively applied. Horsepower rating in an engine furnishes an analogy. A six-cylinder marine engine develops 125 HP at 3000 revolutions per minute. In what? A 24 foot V-bottom runabout with a 15 x 14-inch pitch propeller. But in a 30-foot cabin cruiser the same engine has no effective power unless a 2 to 1 reduction gear is used with a propeller of larger diameter and less pitch. This permits the engine to supply effective power. It carries more load though at less boat speed. Still the engine develops 125 HP at 3000 revolutions per minute in either boat.

Future automatic weapons, or any weapons, must be evaluated and developed with all the factors clearly in mind. The objective is *fire effect*. Fire power *per se* is one and only one factor. Mobility is especially important. Flexibility, adaptability, and versatility are vital considerations. Weapons must be readily moved to favorable positions from which targets can be engaged. The future infantry problem is not solved by putting an old-fashioned heavy machine gun on a hill and expecting profitable fires to be delivered hourly just because the gun has "firepower." The fire must be carried to the targets. That is the problem. USMC

The Marines in the Pacific War

continued from page 20

behind Point Cruz, was pinned down by the same intensive fire that had stopped Griffith, and Rogers himself was killed. He had confided his plans to no one, so this battalion was without direction; and now, the Japs having stopped the other moves, they turned to on it in style, working parties through to cut it off from the beach and hitting it from all directions. The movement was seen from *Ballard*; it was clear the battalion would have to be pulled out at once and Division headquarters was notified. But fortune arranged it that just at this moment the heaviest air raid that Guadalcanal had yet seen came pounding down, 28 heavy bombers. A couple of them got through and one laid an egg on headquarters, probably the most damaging single bomb hit of the campaign, for it blew up the division switchboard and destroyed all communications.

Messengers had to carry orders for the Raiders to withdraw. The boats went out to pick up the lost battalion and *Ballard* moved inshore to shell the Japs along the beach while the marines began to fight their way out. Up in the sky a squadron from *Enterprise*, which had landed on the field that day, leaped joyously into combat with the bombers. The planes did well; 35 Japs tumbled down that afternoon and the next when they tried their bombing stunt again. The destroyer did well; caught between her fire and that of the marines cutting their way through, the Japs along the beach gave way and Roger's command escaped. But they had 43 casualties to pile on those suffered by the Raiders and the 5th and there was no question but the operation was a complete failure, another demonstration that successful war cannot be made on wrong information.

III

THE FAILURE HAD, HOWEVER, THE EFFECT OF drawing attention to the Matanikau area and Gen Vandegrift did a little hard thinking about the significance of the action and the fact that patrols in the Grassy Knoll region had to be made larger and larger and almost always had some action. It was clear that the Japs were getting heavier forces into the island for a new drive on the airfield and the very fact they were being deliberate about their move indicated that when the new attack came, it would be well above those previous both in skill and intensity.

The General had been assured of more reinforcements in the form of Army troops and he knew that a naval reinforcement was also on the way, both PT boats which could do something about the Japanese convoys at night and heavy ships to fight for control of the surface waters, but the over-all shipping situation in the Pacific was still extremely tight with all existing bottoms and new construction being siphoned off for the operations in Africa. It was likely to be deep in October before the Army troops could reach the island and at least the same time before the Navy could cut off the flow of enemy units—if indeed they could. Well before that the Japanese effort could be expected.

Why were they so interested in the Matanikau? Our planes had seen enough of the stuff getting ashore to know that there was heavy equipment in it—tanks and big guns. Scouting and improved maps had rendered the geography of Guadal's north coast a known factor and it was apparent that there was only one route by which such heavy equipment could be moved from the western end of the island east toward the airfield—the route that crossed the sandbar at the Matanikau mouth. If they got across there nothing could stop them till the hill overlooking Kukum and the perimeter of the defense was reached. From a point outside that perimeter to the precious airfield was approximately 5,000 yards, which is good accuracy range for light artillery.

This is what they were up to, then; they were going to gain a position from which they could keep the airfield under fire and forbid it to our planes. Even though he lacked men to bring the Matanikau crossing into the perimeter it would be necessary for the General to establish a battle position there. The southern flank was now well fortified and wired in and men no longer needed for labor details. A forward movement was accordingly ordered for 7 October. This was the plan:

Edson with the 5th Marines to reach and hold the right bank of the Matanikau. A special group had been made up of part of the 2d Marines with a scout-sniper detachment of picked men under LtCol William J. Whaling, who had been a not very effective exec of the 5th, but who had proved a hell of a good bush-whacking fighting man; this group to follow the 5th in, then circle Matanikau Village from the upper reaches of the river, crossing by a little bridge, the Nippon Bridge. Two battalions of the 7th (Col Amor L. Sims) to follow Whaling, extend his left flank and also attack toward the sea. If all went well, the 5th would pass through the other formations when they reached Matanikau Village, attack straight ahead, take Ko-

kumbona and leave a small permanent garrison there to control the heads of the trails that lead into the back ridges. The Matanikau crossing was to be held in force. Artillery and air cooperation were worked out with care.

IV

LT GEN HYAKUTATE WAS BITTERLY DISAPpointed over the failure of Gen Kawaguchi's attack. He did not express it that way of course, remarking in his report that although the attack had been successful, further efforts would be needed to mop up the American remnants on Guadalcanal. The fact that there were remnants was primarily the fault of the Imperial Navy, which had given him inadequate air support and had been so slow in moving troops in that they arrived in insufficient force. He complained to Tokyo, and since the naval authorities, true to the principles laid down to them by the sacred Meiji, refused to mingle in politics even in defense of their own ideas, they received orders to second the Army more thoroughly. The Southeast Area Fleet was augmented by four battleships and a number of lighter units; three of the light cruisers were assigned to bring troops of the Sendai Division from Java to Rabaul and additional supplies of the naval aircraft were directed to the latter point to make good the losses suffered. The field at Buka had been worked on extensively and could now be used by any type of plane.

The 1st and 2d Fleets were brought down to Truk to make another sweep toward Guadal and cover a major reinforcing move, this time to be made in transports. Meanwhile the Sendai were forwarded by means of destroyers operating at night, as fast as they arrived at Rabaul. The system was thoroughly satisfactory except for the continual annoyance of American planes, which attacked the men just after they landed. Complaints that the antiaircraft guns were ineffective were forwarded to headquarters with requests that more such guns accompany future units.

On 4 October LtGen Masai Maruyama of the Sendai reached the island with his headquarters, assumed command and went forward to make a personal inspection of the line. The initial regiment (4th Infantry) had now arrived with a number of artillery formations. The 16th and 29th were at Rabaul with the heavy guns, tanks, and a Naval Landing Force brigade, giving the General some 20,000 men all told, to whom could be added some 1,900 still remaining of the Kawaguchis, mostly Col Oka's command.

Gen Maruyama did not find conditions too satisfactory, either morally or tactically. The remaining Kawaguchis were nearly all infected with malaria and those who came through the jungles from south of the airfield were frightfully emaciated and very weak, but all had been forced to stay in their lines sick or not, because of the shortage of troops. To be sure Col Oka's men with a good deal of help from the first comers of the Sendai had beaten off an American attack on September 27th, but these weak and hungry men had lost much of the true *bushido* and told disgusting tales of horror to the newcomers. The Americans on this island (they said) were not the ordinary Army troops but Marines, a special force recruited from jails and insane asylums for their bloodlust. Instead of according honorable death to the prisoners they cut off their arms, then staked them on the airfield and ran over them with steam rollors. A letter written home by one of his men was shown to the General:

"The news I hear worries me. It seems as if we have suffered considerable damage and casualties. They might be exaggerated, but it is pitiful. Far away from our home country a fearful battle is raging. What these soldiers say is something of the supernatural and cannot be believed as human stories."

On the tactical side it was perfectly clear to the General that Col Oka had been culpably careless in not keeping his lines close up to the American perimeter and insuring the passage at the mouth of the Matanikau for the guns and tanks with which to knock out the airfield. The Colonel complained that his men were worn with illness, and he had so much influence in high quarters at home that relieving him would only make trouble, so Gen Maruyama did the next best thing—pulled Oka's men out of the Matanikau position entirely and sent forward Col Nakaguna's fresh 4th Regiment. One battalion of the regiment was to cross by the sandbar, occupy the east bank of the mouth of the river and dig in; another to gain and hold the Nippon Bridge crossing farther inland while the third battalion remained in reserve. This was to be done at once, as soon as the troops could be pressed forward, and they should all be in position by the night of 6 October. To brace morale a general order was issued:

"From now on, the occupying of Guadalcanal Island is under the observation of the whole world. Do not expect to return, not even one man, if the occupation is not successful. Everyone must remember the honor of the Emperor, fear no enemy, yield to no material matters, show the strong points as of steel or of rocks, and advance valiantly and ferociously. Hit the

enemy opponents so hard they will not be able to get up again."

The move was indeed begun but some American planes interrupted it; the regiment had to take cover and night found it still short of the objective. Col Nakaguna had his men dig in as a precaution against night attacks, on the west bank. Two or three companies under cover of falling darkness did manage to get across the sandbar and prepared to move further out next morning.

V

AT 0700 EDSON'S REGIMENT STARTED ALONG the "government trail" that skirts the coast. It was a little after ten and still some 300 yards short of the Matanikau when the leading battalion began to get machine-gun fire, spread and developed the position as held by a Japanese group of above a company strength. Another battalion worked leftward and by noon had reached the river higher up while some half-tracks were brought up to fire into the enemy position and the advance resumed in the manner of advance against fire—slowly and with continual shooting. The Japs seemed quite willing to shoot back and night came down while the 5th was still well short of the river mouth.

Whaling's men and the 7th had encountered a small amount of sniper fire and some patrol activity. They halted for the night east of the stream and just short of Nippon Bridge. During the night Edson's men brought up some amphtracs which wallowed around like water buffaloes in the mid-stream region to give the enemy the impression a crossing was intended there. A company of Raiders was sent up from division reserve to reinforce the attack on the small Jap bridgehead. Whaling and the 7th were still to proceed as planned. Unfortunately toward dawn it began to rain with a violence seldom seen even among the Solomons. All the trails foundered and though Whaling did indeed get across the Nippon Bridge, the continuing drench reduced his pace to an inch an hour.

Neither, under that downpour, could the Japs on the east bank all be eliminated, so they were penned against the stream and the Raider company on the extreme right reached the edge of the sandbar, where wire was hastily strung. It was decided to postpone the enveloping attack to the next day and everyone had begun to cuddle down for the night when about 1800 the Japs on the east bank gave a unanimous whoop and broke for the sandbar, throwing smokebombs in all directions.

There was a brief savage flash of hand-to-hand fighting in which a squad of Raiders was practically wiped out but the Japs who got away left 67 of their number behind. That night Gen Vandegrift got a message from SOPAC Headquarters that air and submarine reconnaissance as well as code intercepts indicated a Jap movement of major proportions was imminent. His need then was to build up a general reserve. He changed plans, ordered the Whaling-Sims force to make its attack as before on Matanikau Village, but that would now be the end of their operation. When they reached the shore they would withdraw, the 5th Regiment covering, and two battalions would be left in the new forward battle position, horseshoe shaped, from Nippon Bridge to the river mouth.

The 9th broke clear; Whaling and Sims went forward and by 1000 had reached the shore on both sides of Point Cruz. A big ridge comes down to break just west of this spot. LtCol Puller, who had the battalion farthest west, discovered the wooded ravine under this ridge to be swarming with Japs, apparently concentrating for a counterattack. He brought up every mortar in the battalion to give the place a heavy pasting, at the same time calling for artillery fire and air bombing and this so much discouraged the enemy that they gave up the idea of counterattack. Our forces pulled out without trouble, though not without casualties, 65 killed and 125 wounded for the whole movement. This could be compared with 253 Japanese bodies found plus whatever wounded they had—not a large score for a two-regiment operation. Gen Vandegrift was disposed to be dissatisfied; he might have been less so had he been able to see Gen Maruyama's orders or the dolorous report that gentleman was forced to make on having lost the Matanikau position—or the report of Col Nakaguna that one of his battalions had been nearly wiped out with 600 dead.

VI

THE SHELLING TO WHICH THE AMERICAN AIRfield had been subjected from the sea had evi-

dently failed of their objects since the planes sure to carry this matter further as well as to get troops into Guadalcanal more quickly, Capt Ohmae, the staff planner at Rabaul who had set up the Savo Island victory, planned a combined operation. A big seaplane tender and two destroyers would run into Guadalcanal by a route south of the Russells on the night of 11 October, the tender carrying tanks and heavy guns, the destroyers troops. The 6th Cruiser Division meanwhile would run straight down the Slot and subject the airfield to prolonged and deliberate shelling which destroyed the planes and their revetments, accompanied by a single fast transport. The following morning would make it clear whether this result had been achieved. If not, the cruisers (*Aoba, Furataka, Kinugusa*) would return the following night and finish the job, and on the night following that the remaining troops of the Sendai Division would set out in transports, which could be used since by that time there would be no American planes to bother them except a few B-17s that nobody minded. Rear Adm Goto was in command of the ships.

No one knows whether this plan would have worked or not because it crossed a counterplan from the American side. Halsey, the raider of the Marshalls, had arrived at Nouméa to relieve Ghormley, who might be a good planner, but certainly not the kind of leader we needed for the desperate dogfight into which Guadalcanal had evolved. The new chief brought naval reinforcements—not many, only a handful of cruisers, and there were still not enough destroyers—but what was far more important, he brought his own dashing, chance-taking leadership and all along the line of the naval service, men began to pick up their heads and to think they might yet win this war.

It is necessary to remember that as of 10 October 1942 there seemed a very good chance that we would lose it. Coral Sea and Midway, yes; our naval air fought those and it covered itself with glory. The submarines were doing well. But the rest of the Navy, in fact the Navy as a whole, had not looked good. *Oklahoma* and *Arizona* had left the fleet forever at Pearl Harbor, *Lexington, Yorktown* and now *Wasp* were gone, *Saratoga* and *North Carolina* were in for repairs. In the Java Sea we had lost a heavy cruiser and a whole division of destroyers; at Savo three cruisers more, and our destroyer loss now stood at 15 ships. What had the Japs paid for this? The carriers of Midway, one at Coral Sea, two cruisers to submarines and a few destroyers—not a Jap ship was sunk by the surface Navy. They were ahead.

Halsey's first act was to give them a chance to get still further ahead. On the very night that Adm Goto came down to blow out the airfield four long grey cruisers slid through the twilight past Lunga Point and went to take up sentry-go between Savo Island and Cape Esperance, where the others had gone down. *San Francisco, Salt Lake City*, heavies; *Helena, Boise*, lights; with destroyers *Farenholt, Benham, Laffey, Duncan, McCalla* under RearAdm Norman Scott.* They steamed in line to and fro past the cape, and *Salt Lake* catapulted a plane with flares, but something went wrong and the plane blew up in a blaze of light just after 2300. Among our ships officers cur ed and stamped the deck thinking this meant the Japs had surely seen them.

They had; but Goto thought it was a flare from his own transport group south of the Russells, fired for reasons unknown, and pressed straight on in a column with two destroyers flanking ahead and two more at the tail. They showed as radar pips just as our ships completed a turn. Adm Scott realized he was in a dream position of already crossing the enemy's T and ordered "Commence firing." Out blazed the guns in level sheets of lightning; back on Guadal the marines roused from sleep wondered with an apprehension born from memories of Savo

*To compare with Savo Island, the Japs could now bring to bear 18 8-inch against 19 in our fleet which would not have been a bad match but we had the 30 6-inch guns of the light cruisers which upset the balance.

what was happening as thunder rolled across the black water and the whole sky was lit with the glare of a burning ship.

The flares and fighting died; Col Thomas ran with the dispatch into Vandegrift's tent where the General waited anxiously beside a single blue bulb, and the news was good, the bill for Savo had been met. We had lost the destroyer *Duncan* and two of *Boise's* turrets were burned out but *Furutaka* was gone, broken in two and sunk by ten rapid salvoes from *Salt Lake; Aoba* was staggering homeward, horribly mauled by over 40 hits with half her crew dead; would not see action again for more than two years; two of the big Jap destroyers *(Natsugumo* and *Fubuki)* were at the bottom of the lagoon and so was their fast transport.

Next morning all the planes from Henderson Field boiled out, the fighters covering *McCalla* while she rescued the *Duncan* survivors, dive-bombers after the retreating Japs. The planes caught them near the northern end of Santa Isobel trying to get *Aoba* in, and it cost them another big destroyer, *Murakumo,* to save her. While this was going on a little squadron of PTs nosed into the lagoon and cast lines ashore. "I remember," said their commander, "one haggard, red-eyed youngster of a marine with a Jap knife stuck in his belt, who said, 'Just teach the bastards to stay home in bed nights where they belong. Just do that and we'll remember you in our prayers.' "

The basis of Capt Ohmae's plan had changed but with that "tenacity" so much valued among his nation and so difficult for an Occidental to understand, he proceeded as though it had not. Indeed, there was something left of it; the sea-plane tender had landed her heavy guns while the naval battle was going on, and on the 13th they registered on the airfield from long range, cutting up the main strip so much that the fighter strip had to be used instead. That same night seven transports started down from Rabaul as planned; a division of the Southeast Area Fleet with two battleships in it saw them in, running through the lagoon and treating the airfield to the intensive shelling the 6th Cruiser Division had been supposed to give. It was extremely effective; of 39 dive bombers in revetments when the sun went down only four were fit to fly the following morning.

But the essential feature of the plan had been to get rid of *all* the Guadalcanal planes through a two-night bombardment and they had not all been eliminated. Helped by the fighters they turned out on the 14th and there was a savage air fight all along the Slot in which one of the Jap transports was sunk and another hit so badly she had to turn back. The rest pushed on; they set their human loads ashore on the night of the 14th but before the supplies could reach the beach the divebombers pounced on them again next morning and burned out three more, while still another was sunk by the PTs.

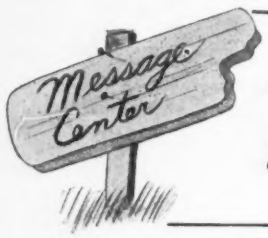
Sum up: Gen Maruyama had his division ashore, present and nearly complete for action, lacking only the men lost at the Matanikau. The airfield had not been put out of business; and it was the General's hard luck that the lost transports had carried most of the heavy artillery ammunition, nearly all the medical stores for his men, and a good deal of their food. The soldiers felt it on a diet of rice relieved only by taro and odd items like island lizards, and they wrote their worries in their diaries:

"The lack of sympathy by the headquarters is too extreme. Do they know we are left on the island? Where is the mighty power of the Imperial Navy?"

There were a good many sick, beri-beri and malaria, but none could be spared for hospitalization. They had to march with the rest till they actually fell down.

to be continued

Japan's greatest ammunition dump in the Pacific, presumably prepared as their main base for the invasion of Australia, was discovered at Rabaul when a Cantonese prisoner, detected smuggling radio parts into the prison camp, revealed that he had got them at a point four miles north-west of Rabaul. Investigation disclosed half a million tons of explosives in a maze of electrically lit cement caves sealed by hundreds of tons of rubble blasted across the entrance.



To the Editor

Marine Corps Board . . .

DEAR SIRS:

There is a common saying that new weapons exert little influence upon tactics. Whether or not this statement is true, the same certainly cannot be said of techniques. The introduction of a new weapon or extensive modification of an existing type is almost invariably accompanied by a change of techniques in the application of tactical principles. New specialties are created, new organizations must be developed and new procedures evolved. For years the Marine Corps has had an agency concerned with the testing and development of new material. This agency, the Marine Corps Equipment Board, even with the personnel restrictions and inadequate testing facilities which were an ever-present problem in our small pre-World War II organization, tested a vast amount of equipment and was instrumental in the development of many items which were later essential to our amphibious march across the Pacific.

On the other hand, the problems of the technique of employment of new weapons and the organizations necessary to keep such new weapons in action did not receive the same scientific treatment. When new items of equipment arrived in an organization and the commander attempted to locate any instructions relative to the technique of employment, nothing was available. He was faced with the necessity of experimenting to determine how the new material could best be used, all with no previously tested techniques from which to work. New organizations, necessary to man recently adopted equipment, were usually set up on paper and not tested by field maneuvers prior to adoption. These conditions carried over into the war with the result that many worthwhile techniques and even items of equipment were slow to be adopted by Fleet Marine Force units simply because they were so busy that neither time nor facilities were available for experimentation and testing. As an example, recoilless weapons saw little or no use by the Marines though extensively used in Europe by the Army. At the same time, the 37mm gun was retained in the infantry regiment though it saw little use in the Pacific. Investigation might well have indicated that the personnel employed in 37mm gun units could have been more profitably utilized to man recoilless weapons.

The obvious solution to this problem of keeping the investigation and development of techniques and organization abreast of the investigation and development of material is to broaden the scope of the activities of the present Marine Corps Equipment Board. If the word "equipment" were eliminated from its title and if it were responsible for the development of techniques and the testing of these procedures under field conditions, greater benefit would be derived by the Marine Corps as a whole. The present location at Quantico makes a satisfactory area available for field work. The presence of the Schools Regiment at this Post enables many small unit organizations and techniques to be readily tested. Also, a close association between the Marine Corps Schools and the Board permits the latter access to the variety of specialties and experiences present among the staff of the former. For the testing of large unit organizations and techniques, it would probably be necessary for the Board to request the assistance of certain Fleet Marine Force units. The net result of a more broadened field for our present "Equipment Board" would insure that a continuing study is made of new developments in organization and techniques as well as equipment. When changes in organization are indicated, new weapons adopted, or new techniques developed, all will have received a thorough field test prior to being made available to the Marine Corps as a whole, and using organizations can have a sound basis for initiating training activities. This would insure a more rapid adoption and a consequent improved efficiency throughout the Corps.

F. R. MOORE,
LtCol, USMC.

Dutch Marine Officers . . .

DEAR SIRS:

During the months of July and August it was my pleasure to have been able to enjoy an extended leave in Northern Europe. While on that leave I chanced into a situation which I think is highly desirable to bring to your attention.

I spent three weeks in Holland, visiting throughout the country. At one point I was asked if I would be interested in visiting the Dutch Marines'

equivalent of our OCS and your camp at Quantico; upon agreeing, arrangements were made and I spent two days among a group of Dutch Marine officers who themselves are the nucleus of their Marine Corps.

These officers, for the greater part 1st and 2d lieutenants and a few captains had recently returned to the Netherlands from the United States, where they had received boot training plus various advanced courses which led to their commissions. This training was undertaken at Quantico and various of your camps in North Carolina. You are undoubtedly familiar with this program.

Never, as far as my memory serves me, have I found such an unbounded enthusiasm for the military way of life in general, nor for the USMC in particular. Evidently your methods of instruction, arms and equipment, and general *esprit de corps* have made a lasting impression on this group, which as I say are cadre-ing the entire Dutch Marine Corps as it is being reborn, laboriously, painstakingly, and yet most surely. Their admiration for the USMC is not only widened in such routine and on the surface matters as instruction and choice of arms and equipment, but upon the more hidden expressionisms such as a "Joe College" type banner with the inscription "Quantico" hanging on a living room wall, or in the ordinary day's conversation which includes nostalgic references to the good times at Quantico.

Therefore, I should like to subscribe to the Marine Corps journal—or GAZETTE—I'm sorry, but I haven't had access to it previously and am not quite sure of the name you've adopted—for a one year period. I'd like it sent to Lt Bram Reynders, Camp Woestuin, Doorn, Holland. Send the bill to me. Further, I'd like to suggest that if you have a precedent for it, you arrange to supply this camp with a back log of your pubilcations for reference. At least, contact them and let them know the USMC is still cognizant of their presence.

I feel rather apologetic for having written in such an informal vein. However, I feel as though I have stumbled into something which should be of extreme interest to you. After all, the Dutch Marine Corps was re-born in the United States, and their policies which now are so closely linked with your idealogies might reasonably remain so if stimulated by a tangible expression of your continued interest in their development.

ROBERT POMERANE,
1stLt, FA

ED: The GAZETTE very happily entered this subscription and has sent back copies.

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DURING the last few months the GAZETTE has been faced with many trying problems. Personnel reductions, paper shortages, printing and trucking strikes, and acquiring new addresses on subscribers returning to civilian life have all conspired to put a squeeze on our limited resources and tight production schedule. Hard felt as these problems are, they hardly bear comparison to one of the biggest bugaboos in the magazine publishing business today—that of withstanding increasing production cost without sacrificing editorial quality and appearance. Most of the large publishers, not desiring to jeopardize their reputation and established appeal, have been forced to increase their subscription and single copy sales price. Others, have resorted to reducing their publications in size and contents rather than increasing their subscription fees. The GAZETTE by exercising every possible economy without noticeably depreciating the quality and appearance of the book has thus far had to do neither. How much longer we can continue to hold our ground is dependent, in great measure, on the assistance you are willing to render the magazine and the Association in the following plan.

AT PRESENT only about 25 per cent of our regular officers are GAZETTE subscribers. Of the remaining 75 per cent, a great majority would probably become subscribers if properly approached and encouraged to do so. That's why we are asking you, as one of our loyal members and subscribers, to lend a hand in our efforts to encourage greater membership in the Marine Corps Association and greater reader interest in the GAZETTE. More specifically, here's how you can help. Merely cut out the subscription blank below and give it to a fellow officer who is not a subscriber and member and urge him to take action now. The fact that the GAZETTE is the only publication designed solely to provide for his professional advancement and edification should convince him of its worth and its inclusion on his "must" list of professional publications.

REMEMBER, the assistance you are willing to give this plan will in large measure determine our ability to continue the GAZETTE on its present level without resorting to a higher subscription and single copy sales price. This is WHY YOUR HELP IS NEEDED and now!

THE MARINE CORPS GAZETTE
official organ of the Marine Corps Association
Box 106, Marine Corps Schools
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Historically Speaking . . .

Confederate Commandos

THE Union sentries aboard the gunboat USS *Underwriter* on the night of 2 February 1864 cursed the cold and the South and the war and tried to find what shelter they could from the wind that curled around Foster's wharf at New Bern, North Carolina. The gunboat was the flagship for the four or five small patrol craft that controlled the Trent and Neuse Rivers and Pamlico Sound and Inlet. She had a single long gun mounted forward and a battery of brass guns aft, and in her hold were 3,800 rifles—rifles that could be used by Gen George E. Pickett, who with 10,000 men was trying to retake New Bern and Morehead.

But Acting Master Westerfelt, captain of the ship, was quite certain that the nearest enemy was many miles away, over half the crew was ashore, and the sentries on deck were oblivious to the shadows that drifted ominously toward them.

Three nights before in his home in Kinston Comdr John T. Wood had laid his plan before Lt Benjamin Loyall also of the Confederate Navy and Capt Thomas B. Wilson, lately of the U. S. Marine Corps but at present with the Confederate Marines. Loyall and Wilson had come down from Richmond by train, along with a number of small flat bottomed scows and a platoon of marines. Other scows had been brought in from Wilmington and some had been built in Kinston. Wood's plan was simple; with some 300 men they would float downstream, take the *Underwriter* by surprise, run her up the Trent to Kinston and unload the rifles. Then they would make a try for the open sea.

The next night, lighted by a brilliant moon, the little force embarked at Kinston and floated downriver with the tide. Early the next morning they beached at Bachelors Creek some miles north of New Bern and after a cold breakfast remained hidden for the rest of the day. The following night was better for their purpose, cold and overcast with no moon to betray them. Now deep in Yankee patrolled territory, they embarked again, cautiously proceeding with muffled oars.

The scows slipped alongside the *Underwriter*; the boarding party consisting of Capt Wilson's 25 marines and some 80-odd soldiers and civilians clambered quickly aboard. A shout of warning from a cold benumbed sentry was cut short in his throat. The business that followed was swift and deadly. For the *Underwriter's* startled and unprepared crew there was a choice of being stretched dead on the deck or diving over the rail and swimming for the shore.

Having gained the deck Comdr Wood sent Lt Loyall below to make ready for getting underway; Loyall found the boilers cold and no means of turning the huge sidewheels other than getting up steam as quickly as possible. Capt Wilson with a number of the boarding party manned the ship's battery of brass guns and her single long gun. By now the shore batteries were alerted by the commotion on the *Underwriter* and had begun to fire. The Union batteries at Bridgeton across the river joined the two that were firing from Fort Steven at New Bern. The *Underwriter* was caught in a crossfire which Wilson did his best to answer, but Wood realized the ship was lost. At his orders the *Underwriter* had slipped her moorings and was drifting; he now ordered her set afire. The wounded and the dead were rolled into the flatboats which were still alongside and the Confederates abandoned ship. As they pulled away, the fire reached the magazine and the resulting explosion sent the gunboat to the bottom of the Neuse River, where she still may be.

The raiders paused at Swift Creek, three miles upriver from New Bern, to bury nine of their own men and eight Union dead in a common grave. From there they rowed unmolested to Kinston where they fade from view so far as history is concerned.